

Oceanographic Data of the 17th Japanese Antarctic Research Expedition 1975-1976

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第17次南極地域観測隊海洋部門報告

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要旨: 第17次南極地域観測において、定常観測(1975-1976)として海上保安庁水路部の担当した海洋観測および潮汐の結果を報告する。

Abstract: This report presents the results of the oceanographic observations, which were carried out by the 17th Japanese Antarctic Research Expedition in 1975-1976.

This report presents the data of the oceanographic observations obtained on board the icebreaker FUJI during the summer mission of the 17th Japanese Antarctic Research Expedition in 1975-1976. The track chart of the cruise is shown in Fig. 1. The locations of the serial (vertical) observation stations, the bathythermograph (BT) observation stations and the expendable bathythermograph (XBT) observation stations in the Southern Ocean are given in Fig. 2.

A tide gauge of pressure type which has a straining gauge was installed in February 1975 and one year record was obtained by this new tide gauge. This report also includes the results of harmonic analysis of the record.

Surface observation: Surface temperature measurements and surface water samplings for chemical analysis were made three times a day during the cruise from Fremantle to Syowa Station and twice a day for the rest of the route so far as the circumstances permitted. The results are given in Table 1.

Current measurement: Measurements of surface current were made with geomagnetic electrokinetograph (GEK) through the cruise except in the magnetic equator region and in the pack ice area. The results are also shown in Table 1.

BT observation: Water temperature distributions in the upper layer (down to about 250 m) were surveyed with bathythermograph (BT) at almost the same frequency as the surface observations. The results are given in Table 2.

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XBT observation : The vertical distributions of temperature in the upper layer (down to about 500 m) were investigated at 10 stations in the Southern Ocean along the track from Fremantle to Mauritius through Syowa Station. The results are shown in Fig. 3.

Serial observation : The serial observations were made at 14 stations in the Southern Ocean along the track from Fremantle to Mauritius (Fig. 2). The data are shown in Table 3 with relevant meteorological data. The interpolated and computed values (temperature, salinity, sigma- t and dynamic depth anomalies) at standard depths are also included in Table 3.

Chemical analysis of sea water : The following are the elements and the methods of analysis (or instruments). The results are also presented in Table 3.

Salinity	Inductive salinometer (Auto-Lab Model 601 MK III)
pH	pH meter (Denki Kagaku Keiki Co. HG-3)
Dissolved oxygen	Winkler's method
Phosphate-P	Molybdenum blue method
Reactive silicate-Si	Molybdenum yellow method
Nitrate-N	Modified Morris and Riley method
Nitrite-N	Sulphanilamide and N-(1-naphtyl)-ethylene-diamine 2HCl were used as reagent.
Ammonium-N	Indophenol method

Tidal observation : The tidal observation was made for one year (1975-1976) at Syowa Station, using the pressure type tide gauge (SWL-7). Processing and analysis of the data were carried out at the Hydrographic Department by the electronic computer. The least squares method was employed in the harmonic analysis. Harmonic constants, characteristic of the tide and other details are given in Table 4.

Acknowledgments

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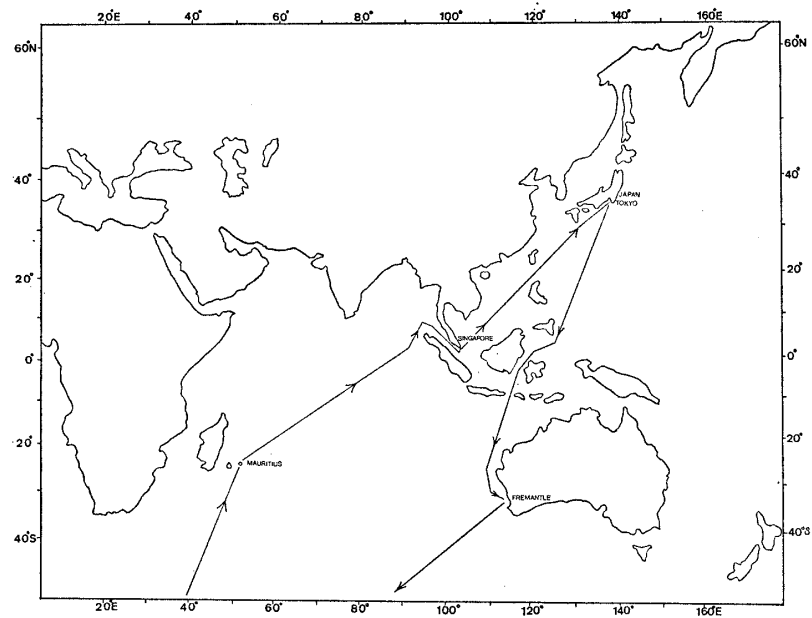


Fig. 1. Track of cruise 1975-1976.

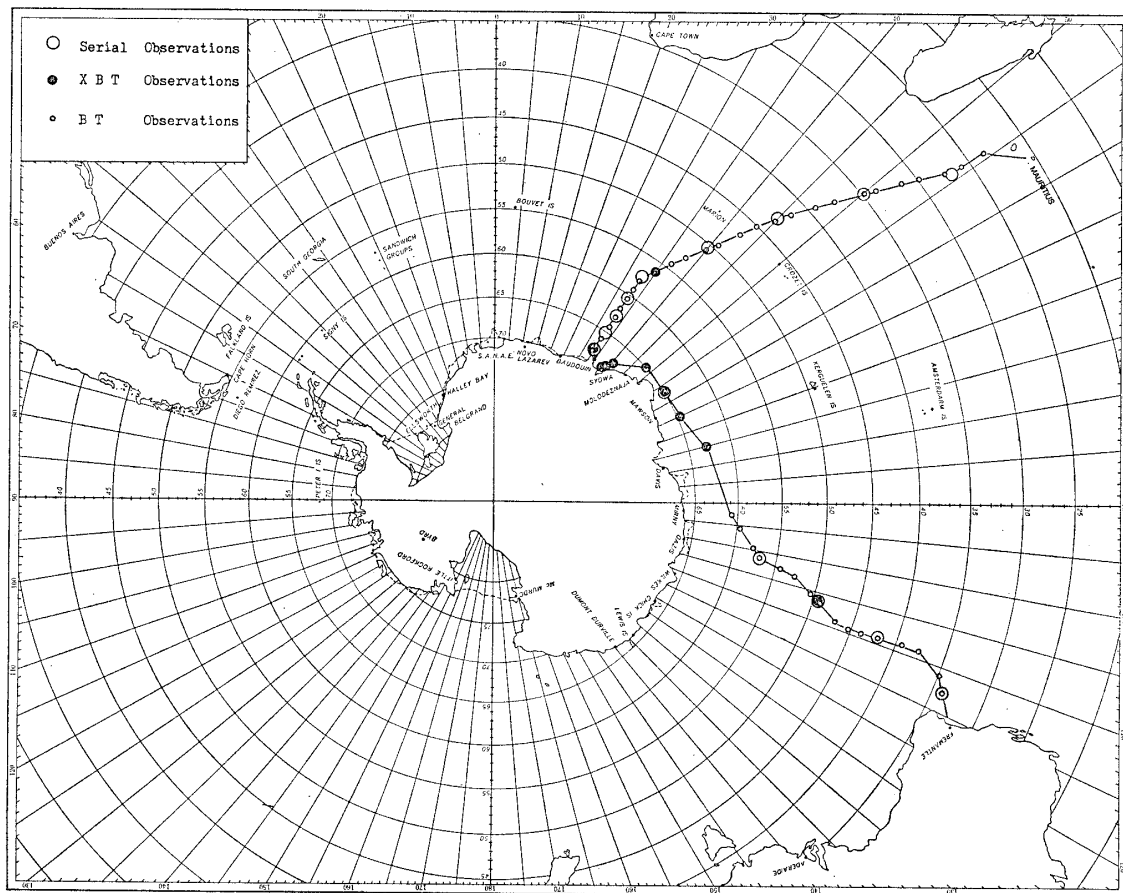
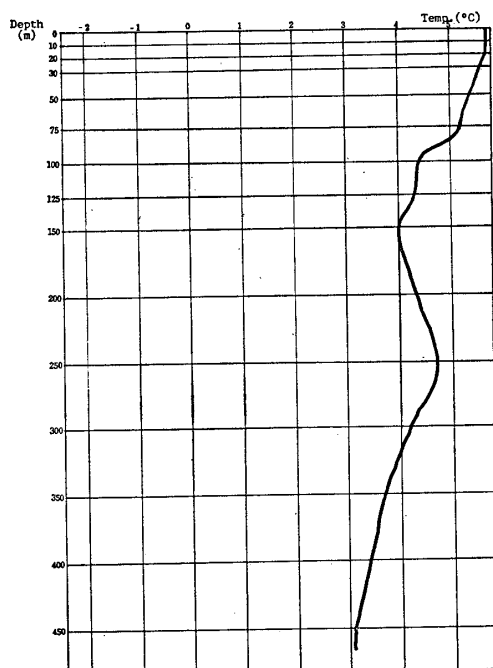


Fig. 2. Track of JARE-17 cruise and oceanographic station.

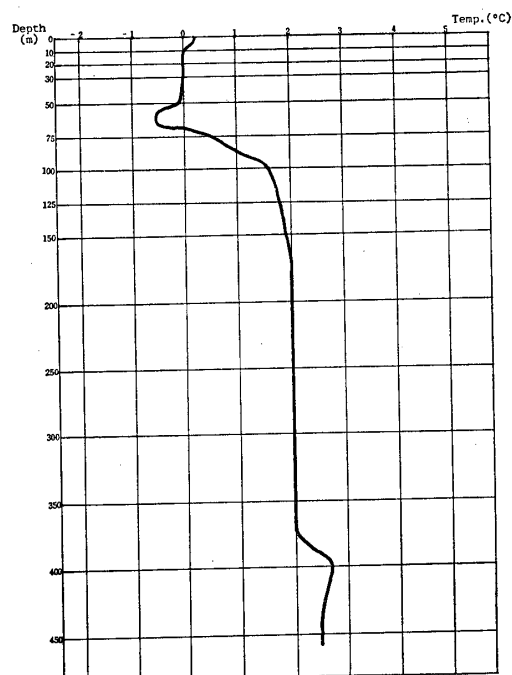
Location 49°10'S, 106°35'E
 Time 03h00m (GMT)
 Date Dec. 21, 1975
 Remarks Water temp. 5.7°C

Operator N.S. Y.O.
 Serial No. 1



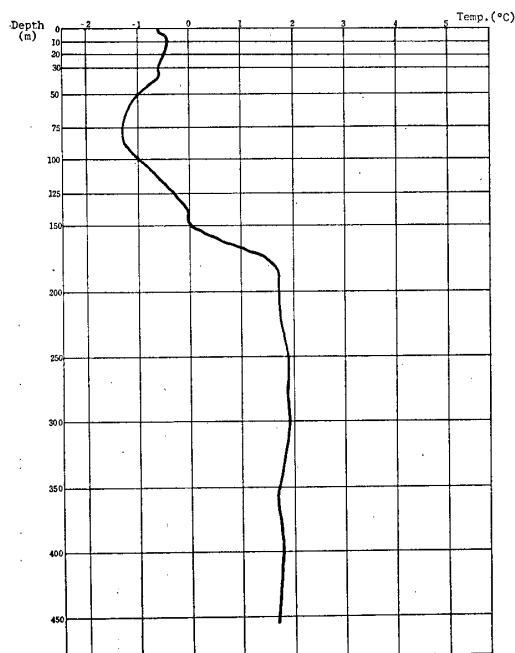
Location 62°47'S, 75°39'E
 Time 13h00m (GMT)
 Date Dec. 26, 1975
 Remarks Water temp. 0.2°C

Operator N.S. Y.O.
 Serial No. 2



Location 64°38'S, 65°05'E
 Time 13h00m (GMT)
 Date Dec. 27, 1975
 Remarks Water Temp. 0.6°C

Operator N.S. Y.O.
 Serial No. 3



Location 64°56'S, 58°01'E
 Time 14h00m (GMT)
 Date Dec. 28, 1975
 Remarks Water Temp. -0.4°C

Operator N.S. Y.O.
 Serial No. 4

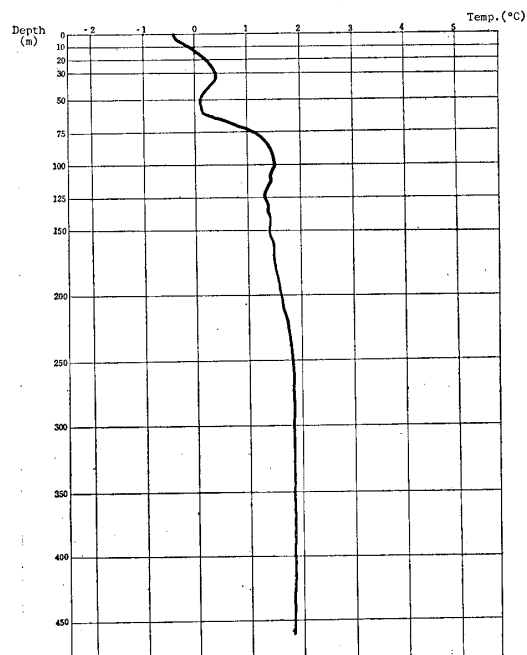
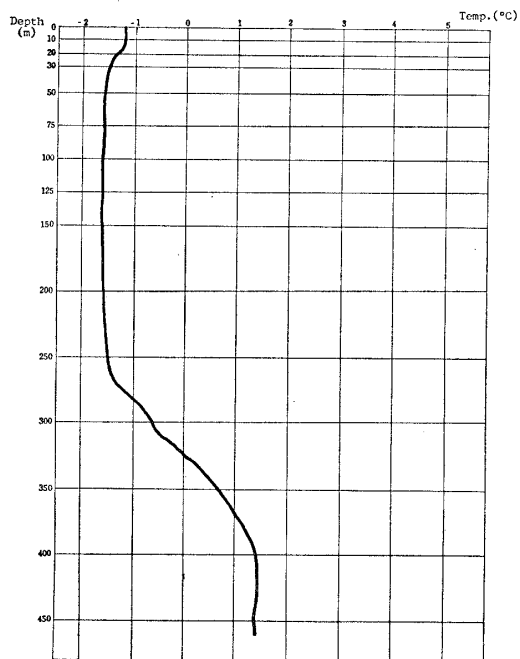


Fig. 3. XBT recorder.

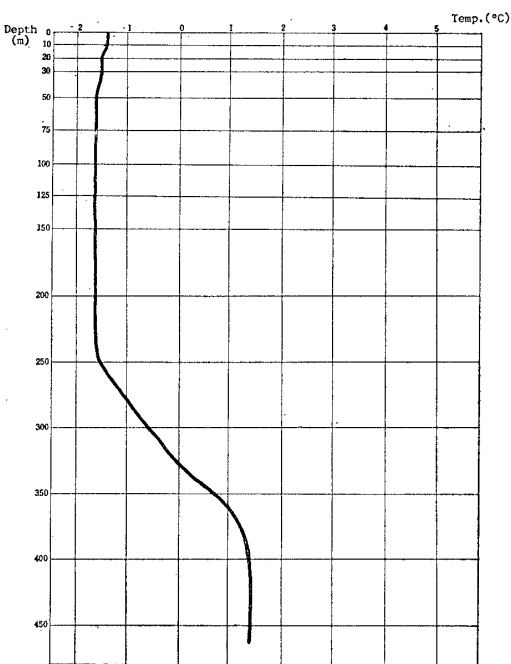
Location 66°57'S, 48°39'E
 Time 14h00m (GMT)
 Date Dec. 29, 1975
 Remarks Water Temp. -1.2°C

Operator N.S. Y.O.
 Serial No. 5



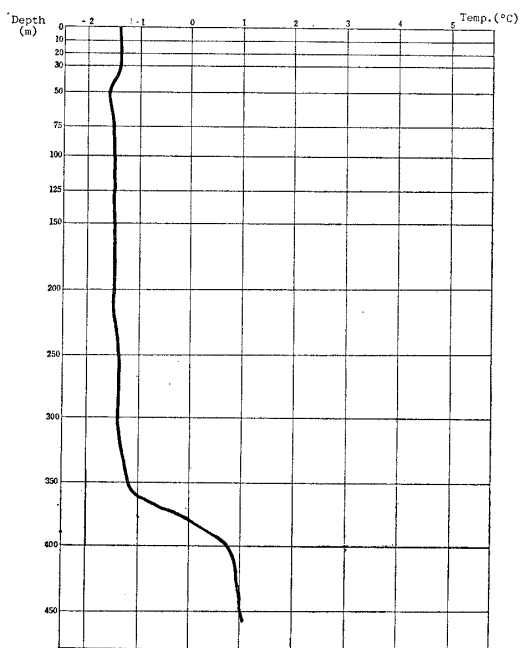
Location 67°32'S, 40°23'E
 Time 15h00m (GMT)
 Date Dec. 30, 1975
 Remarks Water Temp. -1.4°C

Operator N.S. Y.O.
 Serial No. 6



Location 68°08'S, 39°56'E
 Time 15h00m (GMT)
 Date Dec. 31, 1975
 Remarks Water Temp. -1.4°C

Operator N.S. Y.O.
 Serial No. 7



Location 68°25'S, 38°42'E
 Time 15h00m (GMT)
 Date Jan. 5, 1976
 Remarks Water Temp. -1.5°C

Operator N.S. Y.O.
 Serial No. 8

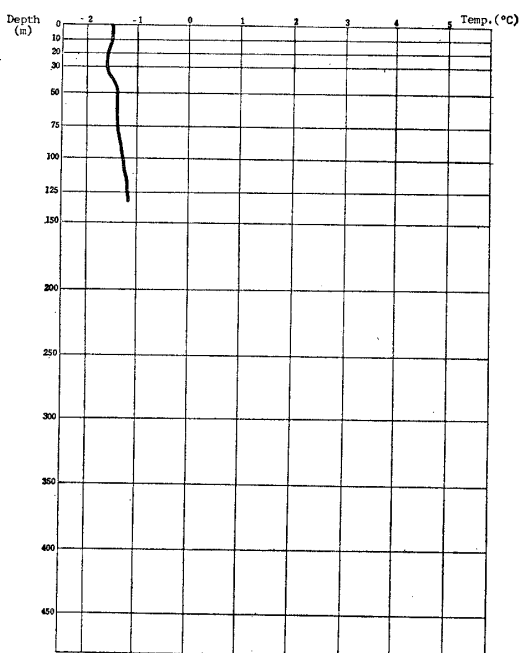


Fig. 3. XBT recorder.

Location 67°30'S, 33°21'E
Time 15h00m (GMT)
Date Feb. 25, 1976
Remarks Water Temp. -0.2°C

Operator N.S. Y.O.
Serial No. 9

Location 56°45'S, 34°27'E
Time 15h00m (GMT)
Date Feb. 29, 1976
Remarks Water Temp. 3.0°C

Operator N.S. Y.O.
Serial No. 10

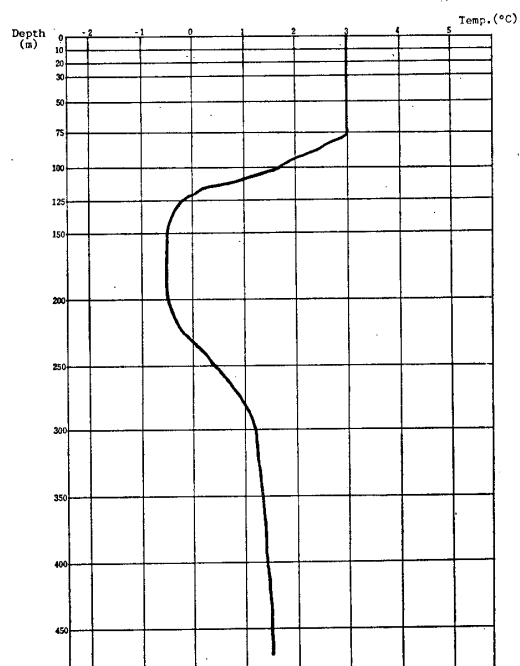
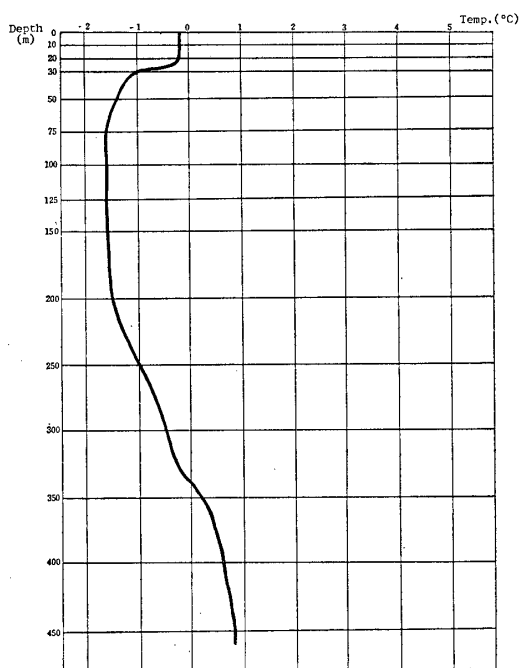


Fig. 3. XBT recorder.

Table 1. Surface observation data.

Date	Time		Position		Air temp. °C	Water temp. °C	S ‰	pH	O ₂ cc/L	μg-atoms/L				Alkalinity meq/L	Current	
	GMT	LMT	Lat.	Long.						Phos- P	Sili- Si	Ni- N	Ni- N	Am- N	Dir.	Speed (Kn)
1975 Nov. 25			Leave Tokyo													
26	09-00	18-00	30-31 N	137-05E	18.8	23.7	34.432	8.22	4.89	0.06	4	0.10	0.0			
27	23-00*	08-00	27-43	135-41	22.5	23.2	34.505	8.23	4.92	0.06	1	0.02	0.0	0.0		
	09-00	18-00	25-53	134-56	23.3	24.2	34.594	8.26	4.87	0.06	1	0.02	0.0	0.0		
28	23-00*	08-00	23-01	133-43	24.2	25.1	34.530	8.30	4.85	0.02	1	0.02	0.0	0.0		
	09-00	18-00	20-59	132-55	25.4	26.3	34.441	8.31	4.66	0.00	3	0.01	0.0	0.0		
29	23-00*	08-00	18-11	131-56	26.9	27.3	34.461	8.31	4.43	0.02	0	0.01	0.0	0.0		
	08-00	17-00	16-27	131-31	27.2	27.6	34.352	8.35	4.58	0.08	1	0.00	0.0	0.0		
30	23-00*	08-00	13-44	129-36	28.4	28.2	34.432	8.34	4.57	0.04	0	0.00	0.0	0.0		
	08-30	17-30	12-59	128-32	28.2	28.7	34.402	8.33	4.50	0.08	2	0.01	0.0	0.1		
Dec. 1	22-30	07-30	9-13	127-25	28.8	28.8	34.189	8.32	4.46	0.12	1	0.03	0.0	0.5		
2	09-00	18-00	6-26	126-33	28.9	28.7	34.320	8.33	4.52	0.08	3	0.01	0.0	0.1		
	00-00	08-00	3-40	123-37	28.3	28.8	33.967	8.34	4.61	0.08	4	0.01	0.0	0.1		
	10-00	18-00	2-27	121-57	26.5	29.2	34.004	8.35	4.56	0.02	2	0.01	0.0	0.1		
3	00-00	08-00	0-54	119-52	25.8	28.5	33.279	8.35	4.61	0.06	3	0.02	0.0	0.2		
4	00-00	08-00	3-58S	118-28E	25.5	29.1	33.303	8.34	4.53	0.04	4	0.07	0.0	0.0		
	10-00	18-00	6-12	117-37	27.8	29.1	33.739	8.36	4.59	0.04	3	0.03	0.0	0.0		
5	00-00	08-00	9-00	115-38	25.6	29.0	33.395	8.37	4.61	0.06	4	0.03	0.0	0.1		
	10-00	18-00	10-22	114-33	29.1	29.2	34.095	8.36	4.63	0.10	4	0.01	0.0	0.1	323	1.3
6	00-00	08-00	12-11	112-49	28.0	28.6	33.617	8.36	4.70	0.00	2	0.02	0.0	1.2	161	0.6
	09-00	17-00	13-44	112-40	27.5	27.9	34.115	8.29	4.66	0.04	2	0.03	0.0	0.1	106	0.5
7	00-00	08-00	16-06	111-38	26.2	27.9	34.099	8.33	4.66	0.04	3	0.02	0.0	0.2	299	0.8
	10-00	18-00	17-57	110-29	25.1	27.6	34.301	8.32	4.66	0.14	2	0.04	0.0	0.3	112	0.5
8	00-00	08-00	20-29	110-47	23.5	24.5	34.697	8.28	4.88	0.18	4	0.01	0.0	0.0	272	0.4
	10-00	18-00	22-15	111-09	23.4	23.7	34.884	8.31	5.03	0.12	3	0.01	0.0	0.1		
9	00-00	08-00	24-45	111-57	23.9	24.3	34.723	8.26	4.93	0.10	4	0.02	0.0	0.1		

* The time of date of the preceding day.

Date	Time		Position		Air temp. °C	Water temp. °C	S ‰	pH	O ₂ cc/L	Phosphate-P µg-atoms/L			Nitrate-N µg-atoms/L		Ammonia-N meq/L	Current	
	GMT	LMT	Lat.	Long.						Si	P	N	Si	N		Dir.	Speed (Kn)
Dec. 9	09-00	17-00	26-23S	112-33E	24.3	23.1	35.071	8.32	5.04	0.12	4	0.00	0.1	0.0			
10	10-00	18-00	26-33	112-38	23.8	23.1	35.089	8.36	5.10	0.14	1	0.04	0.0	0.0			
	00-00	08-00	29-11	113-38	21.2	22.2	35.089	8.36	5.10	0.14	1	0.04	0.0	0.0			
11	09-30	17-30	30-48	114-31	20.5	21.9											
	10-00	18-00	30-53	114-35	20.5	21.9	35.205	8.35	5.22	0.12	4	0.04	0.2	0.2			
11			Arrive in Fremantle														
16			Leave Fremantle														
17	10-00	18-00	32-25S	114-27E	19.3	20.3	35.418	8.34	5.28	0.12	2	0.01	0.1	0.0			
	01-00	18-00	34-10	111-58	17.1	18.5		8.39	5.54	0.10	2	0.01	0.0	0.0		75	0.5
18	06-00	13-00	34-32	111-25	18.5	19.1	35.598	8.40	5.50	0.12	2	0.00	0.1	2.3			
	11-00	18-00	35-15	110-45	16.2	17.3	35.660	8.38	5.55	0.10	2	0.00	0.0	0.2		216	0.6
19	01-00	08-00	38-33	109-02	14.5	14.3	35.331	8.37	5.98	0.33	1	0.06	1.0	0.5		300	0.3
	06-00	13-00	37-40	108-58	14.6	13.7	35.035	8.34	6.16	0.45	0	0.08	4.3	0.4			
20	11-00	18-00	39-14	109-00	14.0	13.8	35.113	8.33	6.18	0.39	1	0.08	3.4	0.3		279	0.3
	01-00	08-00	42-01	109-00	12.7	11.9		8.30	6.22	0.56	8	0.21	7.9	0.1		13	0.3
21	06-00	13-00	42-16	109-01	13.2	11.6	34.626	8.34	6.46	0.72	1	0.23	9.0	0.1			
	11-00	18-00	43-04	109-01	12.1	11.1	34.648	8.32	6.51	0.76	3	0.23	9.2	0.4		36	0.3
22	01-00	08-00	45-46	109-12	10.0	8.7	34.274	8.29	6.85	1.00	2	0.26	13.	0.4		41	0.6
	06-00	13-00	46-24	109-04	9.6	8.3	34.205	8.27	6.89	1.05	1	0.25	15.	0.7		56	0.3
23	11-00	18-00	47-06	108-39	9.5	8.3	34.231	8.27	6.85	1.07	1	0.25	14.	0.2		12	0.3
	01-00	08-00	49-06	106-40	5.9	5.7		8.24	7.22	1.48	5	0.23	19.	0.3			
24	06-00	13-00	49-32	106-14	6.5	5.5	33.886	8.26	7.32	1.52	2	0.28	14.	0.6			
	11-00	18-00	50-14	105-29	6.0	5.3	33.907	8.27	7.37	1.54	3	0.25	21.	0.1		325	0.8
25	01-00	08-00	52-23	103-04	4.2	4.4	33.906	8.29	7.53	1.52	1	0.27	24.	0.0		56	0.3
	06-00	13-00	53-13	102-38	4.0	3.3	33.922	8.25	7.70	1.58	3	0.30	25.	1.1			
26	11-00	18-00	54-11	102-21	6.0	2.4	33.963	8.23	7.89	1.70	13	0.30	21.	1.8		134	0.6
	01-00	08-00	56-58	101-45	1.7	1.4		8.25	8.16	1.67	32	0.34	26.	0.1		325	0.1

Date	Time			Position		Air temp. °C	Water temp. °C	S ‰	pH	O ₂ cc/L	Phos- phate- P	Sili- cate- Si	Ni- trite- N	Ni- trate- N	Am- mo- nia-N	Alka- linity meq/L	Current	
	GMT	LMT	Lat.	Long.	Dir.												Speed (Kn)	
Feb. 22					Leave Ongul Islands													
24	15-00	18-00	67-39S	36-42E	-0.5	0.4	33.582	8.26	7.92	1.60	49	0.21	25.	0.3			270	0.2
25	05-00	08-00	67-34	33-25	0.2	-0.4	33.771	8.20	7.91	1.76	62	0.28	25.	0.3			213	0.4
	15-00	18-00	67-30	33-21	-0.1	-0.2	33.814	8.22	7.96	1.84	64	0.27	29.	0.2			228	0.5
26	05-00	08-00	66-08	33-41	0.5	0.2	33.884	8.21	7.74	1.70	45	0.27	30.	0.3			—	0.0
	15-00	18-00	65-03	33-46	1.3	1.0	33.940	8.24	7.68	1.80	48	0.29	28.	0.4			309	0.5
27	05-00	08-00	63-05	33-34	1.6	1.8	33.808	8.21	7.61	1.74	41	0.69	27.	1.4			297	0.9
	15-00	18-00	62-21	33-29	2.0	2.1	33.652	8.21	7.55	1.78	47	0.59	28.	1.2				
28	05-00	08-00	60-19	33-32	1.7	2.6	33.720	8.20	7.55	1.68	36	0.51	26.	0.2				
	15-00	18-00	59-36	33-45	2.8	2.8	33.777	8.20	7.57	1.52	19	0.52	24.	0.7				
29	05-00	08-00	57-44	33-45	2.5	2.5	33.845	8.23	8.16	1.54	27	0.50	20.	0.3				
	15-00	18-00	56-45	34-27	4.2	3.0	33.887	8.19	7.54	1.16	21	0.38	22.	0.9				
Mar. 1	05-00	08-00	64-24	36-55	4.0	3.8	33.832	8.22	7.42	1.60	15	0.37	24.	1.2			354	0.6
	10-00	13-00	53-38	37-39	4.1	4.0	33.790	8.23	7.33	1.42	11	0.39	23.	1.0				
	15-00	18-00	52-50	38-23	5.2	4.4	33.747	8.22	7.30	1.44	11	0.40	22.	0.5			336	0.4
2	05-00	08-00	50-39	40-19	5.5	4.4	33.763	8.21	7.32	1.52	16	0.41	23.	0.4			115	0.3
	15-00	18-00	49-33	41-16	5.3	5.3	33.666	8.22	7.20	1.34	6	0.34	19.	1.0			336	0.4
3	05-00	08-00	46-58	42-33	6.9	8.0	33.743	8.23	6.79	1.34	2	0.23	20.	1.1			155	0.4
	10-00	13-00	46-23	42-52	7.6	8.4	33.752	8.22	6.74	1.26	1	0.27	15.	1.7				
	15-00	18-00	45-32	43-26	8.0	9.6	33.753	8.23	6.59	1.26	3	0.27	17.	1.6			200	0.1
4	05-00	08-00	43-03	45-03	8.8	10.2	33.741	8.23	6.54	1.18	5	0.32	17.	0.3			35	0.7
	15-00	18-00	41-45	45-54	12.0	12.9	33.824	8.25	6.24	0.94	1	0.27	14.	1.6			249	0.3
5	05-00	08-00	39-14	47-40	17.0	20.1	35.593	8.35	5.19	0.16	3	0.00	0.0	0.8			316	1.0
	10-00	13-00	38-22	48-15	18.3	21.0	35.625	8.35	5.12	0.14	2	0.02	0.0	0.0				
	15-00	18-00	37-27	48-47	18.0	20.9	35.551	8.30	5.15	0.20	1	0.00	0.0	0.1			327	1.0
6	05-00	08-00	35-00	50-16	21.0	22.9	35.424	8.30	4.99	0.10	6	0.00	0.0	0.0			252	0.1
	15-00	18-00	33-42	50-55	23.1	23.9	35.429	8.29	4.90	0.20	1	0.01	0.0	0.5			281	0.9

Date	Time			Position		Air temp. °C	Water temp. °C	S ‰	pH	O ₂ cc/L	Phosphate-P		Silicate-Si		Nitrate-N	Ammonia-N	Alkalinity meq/L	Current	
	GMT	LMT	Lat.	Long.	P						Si	µg-atoms/L	Dir.	Speed (Kn)					
Mar. 7	04-00	08-00	31-26S	51-57E	23.2	25.6	35.333	8.34	4.67	0.14	2	0.00	0.1	0.0				265	0.9
	09-00	13-00	30-35	52-23	24.8	26.1	35.251	8.33	4.66	0.04	1	0.01	0.0	0.0					
	14-00	18-00	29-43	52-49	25.0	26.5	35.380	8.33	4.70	0.01	1	0.02	0.0	0.0				51	0.2
8	04-00	08-00	27-19	54-02	25.2	27.3	35.229	8.32	4.77	0.08	7	0.03	0.0	0.1				11	0.4
	14-00	18-00	26-12	54-11	26.8	27.7	35.354	8.31	4.58	0.14	1	0.02	0.0	0.0				45	0.4
	04-00	08-00	23-31	54-14	26.7	27.5	35.360	8.34	4.68	0.16	1	0.01	0.0	0.0				250	1.0
9	09-00	13-00	22-49	54-50		27.7	35.398	8.34	4.55	0.08	2	0.00	0.0	0.0					
	14-00	18-00	22-05	55-31		28.5	35.155	8.32	4.59	0.02	3	0.02	0.0	0.1					
	Arrive at Mauritius																		
10	Leave Mauritius																		
	14-00	18-00	19-07S	59-44E	27.6	27.6		8.35	4.74	0.06	0	0.00	0.0	0.9					
	04-00	08-00	17-44	60-53	27.0	27.3		8.36	4.66	0.10	1	0.01	0.0	0.1					
18	14-00	18-00	16-24	62-15	27.8	28.5		8.34	4.48	0.18	1	0.02	0.0	0.0					
	04-00	08-00	14-48	64-10	28.1	28.7		8.33	4.57	0.18	1	0.01	0.0	0.3					
	14-00	18-00	13-52	65-24	28.0	28.3		8.35	4.56	0.12	2	0.06	0.0	0.2					
20	03-00	08-00	11-28	65-52	26.2	28.3		8.34	4.70	0.20	0	0.05	0.1	0.3					
	13-00	18-00	10-36	67-18	25.5	28.5		8.36	4.68	0.10	3	0.03	0.0	0.0					
	03-00	08-00	9-14	69-37	27.0	28.8		8.35	4.56	0.20	1	0.02	0.0	0.5					
21	13-00	18-00	9-00	71-40	28.5	28.7		8.32	4.68	0.24	1	0.02	0.0	0.1					
	03-00	08-00	7-16	72-50	28.0	27.8		8.38	4.66	0.22	1	0.03	0.0	0.4					
	13-00	18-00	6-23	74-14	27.9	28.5		8.35	4.80	0.20	1	0.01	0.0	0.2					
22	03-00	08-00	5-04	76-14	28.8	28.5		8.36	4.60	0.18	2	0.02	0.0	0.1					
	13-00	18-00	4-05	78-20	28.7	28.7		8.34	4.64	0.20	4	0.05	0.0	0.0					
	03-00	08-00	2-30	80-55	28.8	28.4		8.33	4.60	0.18	0	0.00	0.0	0.0					
23	13-00	18-00	1-23	82-54	28.2	28.7		8.35	4.64	0.18	3	0.06	0.0	0.0					
	02-00	08-00	0-08N	85-22E	27.8	28.7		8.37	4.53	0.16	3	0.03	0.0	0.0					
	12-00	18-00	1-04	87-08	28.3	29.1		8.37	4.61	0.18	3	0.02	0.0	0.0					

Date	Time			Position		Air temp. °C	Water temp. °C	S ‰	pH	O ₂ cc/L	μg-atoms/L				Alka- linity meq/L	Current	
	GMT	LMT		Lat.	Long.						Phos- phate- P	Sili- cate- Si	Ni- trite- N	Ni- trate- N	Am- mo- nia-N	Dir.	Speed (Kn)
Mar. 26	02-00	08-00		2-23N	89-32E	28.2	29.2		8.36	4.66	0.20	1	0.00	0.0	0.3		
	12-00	18-00		3-28	91-05	28.1	29.3		8.37	4.60	0.14	3	0.02	0.0	0.0		
27	02-00	08-00		5-03	93-17	28.4	28.8		8.36	4.56	0.12	0	0.01	0.0	0.2		
	12-00	18-00		6-09	94-54	28.4	29.3		8.36	4.77	0.06	3	0.04	0.0	0.1		
28	01-00	08-00		6-03	97-26	28.4	29.3		8.36	4.56	0.06	5	0.03	0.0	0.0		
	11-00	18-00		5-08	98-29	28.6	29.9		8.38	4.72	0.08	4	0.06	0.0	0.2		
29	01-00	08-00		3-45	100-13	27.6	29.1		8.35	4.61	0.16	11	0.03	0.0	0.2		
	11-00	18-00		2-44	101-11	27.3	28.9		8.33	4.70	0.16	9	0.08	0.0			
30	00-00	08-00		1-36	102-51	26.6	28.6		8.35	4.52	0.28	13	0.17	0.0	0.2		
31				Arrive in Singapore													
Apr. 7				Leave Singapore													
	11-00	18-00		2-21N	105-06E	28.1	29.2		8.35	4.77	0.02	4	0.03	0.0	0.2		
8	00-00	08-00		5-15	106-51	27.6	27.9		8.38	4.71	0.08	3	0.03	0.0	0.0		
	10-00	18-00		7-26	108-15	28.0	28.8		8.36	4.69	0.08	3	0.03	0.0	0.0		
9	00-00	08-00		10-08	110-42	27.5	28.0		8.39	4.70	0.00	1	0.02	0.0	0.1		
	10-00	18-00		11-47	112-30	27.8	28.9		8.37	4.64	0.06	3	0.01	0.0	0.0		
10	00-00	08-00		14-14	115-11	27.2	27.8		8.38	4.72	0.06	2	0.01	0.0	0.1		
	10-00	18-00		16-11	116-55	27.1	28.5		8.38	4.73	0.10	2	0.01	0.0	0.0		
11	00-00	08-00		18-52	119-24	26.0	25.6		8.41	4.86	0.10	2	0.03	0.0	0.1		
	10-00	18-00		20-21	120-47	24.6	25.1		8.43	4.87	0.20	1	0.00	0.0	0.2		
12	00-00	08-00		22-26	122-29	23.8	23.5		8.42	5.00	0.06	1	0.04	0.1	0.3		0.3
	10-00	18-00		24-13	123-23	23.6	24.3		8.44	4.97	0.06	1	0.03	0.0	0.0		1.3
13	23-00*	08-00		26-01	125-16	23.8	24.5		8.42	4.91	0.12	1	0.00	0.0	0.0		0.2
	09-00	18-00		27-04	126-45	23.9	24.4		8.43	5.14	0.06	1	0.02	0.0	0.0		0.2
14	23-00*	08-00		28-28	128-52	21.5	21.8										152
	09-00	18-00		29-25	130-13	18.8	21.9										34
15	23-00*	08-00		31-15	131-51	17.5	21.3										122
	09-00	18-00		32-39	133-11	18.3	20.3										0.4
19				Arrive in Tokyo													

* The time of the date of the preceding day.

Table 2. Bathythermograph data.

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)										
	Day	Month	Year	GMT	LMT	Lat.	Long.	0	10	20	30	50	75	100	125	150	200	250
1	26	Nov.	1975	09-00	18-00	30-31N	137-05E	23.7	23.7	23.7	23.7	23.7	23.7	23.7	22.6	21.7	19.9	18.7
2	27			23-00*	08-00	27-43	135-41	23.2	23.2	23.2	23.2	23.2	23.2	22.9	21.5	20.4	18.8	17.6
3	27			09-00	18-00	25-53	134-56	24.2	24.2	24.2	24.2	24.2	24.2	20.9	19.3	18.4	17.7	17.1
4	28			23-00*	08-00	23-01	133-43	25.1	25.1	25.1	25.1	24.7	24.5	23.2	21.7	20.3	18.4	
5	28			09-00	18-00	20-59	132-55	26.3	26.3	26.3	26.3	26.3	25.2	24.2	23.0	22.3	19.6	18.0
6	29			23-00*	08-00	18-11	131-56	27.3	27.3	27.3	27.3	27.3	27.3	27.3	25.8	24.9	22.1	19.4
7	29			08-00	17-00	16-27	131-31	27.6	27.6	27.6	27.6	27.6	27.6	27.4	25.5	24.3	20.9	18.3
8	30			23-00*	08-00	13-44	129-36	28.2	28.2	28.2	28.2	28.2	28.2	28.2	27.2	26.1	20.6	17.1
9	30			08-30	17-30	12-59	128-32	28.7	28.7	28.5	28.5	28.5	28.4	27.2	26.3	24.3	18.1	13.7
10	1	Dec.	1975	22-30*	07-30	9-13	127-25	28.8	28.8	28.8	28.8	28.8	27.9	26.2	24.3	22.1	15.9	11.7
11	5			10-00	18-00	10-22S	114-34E	29.2	29.2	29.2	27.9	26.9	25.4	23.7	21.4	19.2	15.4	13.1
12	6			00-00	08-00	12-11	112-49	28.6	28.6	28.6	28.6	27.5	25.9	24.9	23.1	20.6	16.9	13.5
13	6			09-00	17-00	13-44	112-40	28.1	28.1	28.1	28.1	26.5	24.9	24.2	22.1	20.5	16.4	12.9
14	7			00-00	08-00	16-06	111-38	27.9	27.9	27.9	27.9	26.3	25.3	23.6	22.3	20.1	18.0	14.7
15	7			10-00	18-00	17-57	110-29	27.6	27.6	27.6	27.6	27.6	25.6	24.2	23.1	21.9	19.0	16.5
16	8			00-00	08-00	20-29	110-47	24.5	24.5	24.5	24.5	22.5	21.8	20.7	19.8	18.6	16.8	15.2
17	8			10-00	18-00	22-15	111-09	23.7	23.7	23.6	23.2	23.2	21.6	20.9	20.1	19.6	18.2	16.6
18	9			00-00	08-00	24-45	111-57	24.3	24.3	24.3	24.3	23.8	22.1	21.5	20.8	20.1	18.8	17.7
19	9			09-00	17-00	26-23	112-33	23.1	22.8	22.3	22.3	22.3	22.2	21.7	21.1		17.8	16.7
20	10			00-00	08-00	29-11	113-38	22.2	22.2	22.0	21.9	21.1	20.6	19.7	18.9	18.4		
21	10			09-30	17-30	30-48	114-31	21.9	21.9	21.1	20.8	20.3	19.4	18.8	18.5	18.0		
22	17			01-00	08-00	34-10	111-58	18.5	18.4	18.4	18.4	16.9	16.0	15.6	14.6	14.0	12.8	
23	17			11-00	18-00	35-15	110-45	17.3	17.3	17.2	17.0	16.9	16.4	15.9	15.3	15.2	14.3	
24	18			01-00	08-00	37-33	109-02	14.3	14.3	14.3	14.3	13.8	13.3	12.1	11.6	11.3	10.9	
25	18			11-00	18-00	39-14	109-00	13.8	13.5	13.5	13.5	13.5	13.1	12.4	11.9	11.8	11.3	
26	19			01-00	08-00	42-01	109-00	11.9	11.7	11.6	11.6	11.5	11.4	10.9	10.6	10.3	10.1	9.9
27	19			11-00	18-00	43-04	109-01	11.1	11.1	11.1	10.8	10.7	10.6	10.9	9.7	9.7	9.9	9.9

* The time of the date preceding day.

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)										
	Day	Month	Year	GMT	LMT	Lat.	Long.											
								0	10	20	30	50	75	100	125	150	200	250
28	20	Dec.	1975	01-00	08-00	45-46S	109-12E	8.7	8.7	8.7	8.7	8.1	8.1	7.8	7.6	7.7	7.6	
29	20			11-00	18-00	47-06	108-39	8.3	8.3	8.3	8.3	8.3	8.3	8.3	7.7	8.3		
30	21			01-00	08-00	49-06	106-40	5.7	5.4	5.4	5.3	5.3	4.3	4.1	4.1	3.6		
31	21			11-00	18-00	50-14	105-29	5.3	5.2	5.1	5.1	4.9	3.9	3.3	3.3	3.3		
32	22			01-00	08-00	52-23	103-04	4.4	—	—	—	4.7	3.6	3.5	3.5	3.1	3.3	
33	22			11-00	18-00	54-11	102-21	2.4	2.4	2.2	2.0	2.0	1.0	0.8	0.8	1.4		
34	23			01-00	08-00	56-58	101-45	1.4	1.4	1.3	1.0	1.0	-0.4	0.1	1.1	1.7	2.1	
35	23			11-00	18-00	57-51	99-54	1.2	1.1	0.8	0.8	0.8	-0.5	0.0	1.4	1.7		
36	24			02-00	08-00	59-41	95-44	1.0	1.2	1.2	1.2	1.2	0.7	0.2	0.1	0.1	1.2	1.9
37	24			12-00	18-00	60-47	92-50	1.0	1.0	1.1	1.1	1.1	0.2	0.1	0.1	0.1	0.7	1.8
38	25	Feb.	1976	05-00	08-00	67-34	33-25	-0.4	-0.4	-0.4	-0.7	-1.2	-1.2	-1.2	-1.0	-1.0	-0.5	0.1
39	26			05-00	08-00	66-08	33-41	0.2	0.2	0.2	0.3	0.3	-0.8	-1.3	-1.4	-1.1	-0.8	-0.7
40	26			15-00	18-00	65-03	33-46	1.0										
41	27			05-00	08-00	63-05	33-34	1.8	1.9	1.9	1.9	2.0	-0.6	-0.9	-0.9	-0.8	0.5	1.9
42	27			15-00	18-00	62-21	33-29	2.1										
43	28			05-00	08-00	60-19	33-32	2.6	2.6	2.6	2.6	-0.1	-0.4	-0.5	-0.4	0.1	2.0	
44	28			15-00	18-00	59-36	33-45	2.8	2.8	2.7	2.7	-0.4	-0.4	-0.4	-0.2			
45	29			05-00	08-00	57-44	33-45	2.5	2.5	2.5	2.5	2.5	0.1	-0.2	-0.2	0.4	1.6	
46	1	Mar.	1976	05-00	08-00	54-24	36-55	3.8	3.8	3.8	3.8	3.8	3.8	1.6	1.0	1.0		
47	1			15-00	18-00	52-50	38-23	4.4	4.4	4.4	4.4	4.4	4.4	2.3	1.7	2.8		
48	2			05-00	08-00	50-39	40-19	4.4	4.4	4.4	4.4	4.4	4.4	2.7	1.6	2.2		
49	2			15-00	18-00	49-33	41-16	5.3	5.3	5.3	5.3	5.1	4.6	3.7				
50	3			05-00	08-00	46-58	42-33	8.0	8.0	8.0	8.0	8.0	6.1	5.8	5.3	5.3	5.3	4.7
51	3			15-00	18-00	45-32	43-26	9.6	9.5	9.5	9.5	8.3	7.2	6.3	5.3	5.2		
52	4			05-00	08-00	43-06	45-03	10.2	10.2	10.2	9.7	7.7	6.4	5.6	4.7	4.3	4.5	4.5
53	4			15-00	18-00	41-45	45-54	12.9	12.9	12.3	11.5	10.1	8.4	7.6	7.4	7.3	6.7	
54	5			05-00	08-00	39-14	47-40	20.1	20.1	20.1	19.9	19.3	19.3	19.1	18.5	17.8	17.1	16.6

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)										
	Day	Month	Year	GMT	LMT	Lat.	Long.	0	10	20	30	50	75	110	125	150	200	250
55	5	Mar.	1976	15-00	18-00	37-27S	48-47E	20.9	20.9	20.4	20.4	19.0	16.8	15.9	15.4	15.4	14.8	14.6
56	6			05-00	08-00	35-00	50-16	22.9	22.9	22.9	21.8	18.5	17.5	16.3	15.7	15.2	15.1	
57	6			15-00	18-00	33-42	50-55	23.9	23.9	21.7	21.2	20.0	17.0	15.7	15.2	15.1	14.6	14.3
58	7			04-00	08-00	31-26	51-57	25.6	25.6	23.7	22.5	20.1	17.6	16.3	15.7	15.3	14.8	14.2
59	7			14-00	18-00	29-43	52-49	26.5	26.5	26.5	26.0	21.7	18.4	17.0	16.4	15.9	15.4	14.8
60	8			04-00	08-00	27-19	54-02	27.3	27.3	27.3	26.2	22.0	18.7	17.8	16.7	16.1	15.1	14.4
61	8			14-00	18-00	26-12	54-11	27.7	27.7	27.7	27.4	22.4	19.4	18.3	17.3	16.9	16.5	15.3
62	9			04-00	08-00	23-31	54-14	27.5	27.5	27.5	27.5	27.2	23.6	22.2	21.7	21.1	19.8	17.8
63	17			14-00	18-00	19-07	59-44	27.6	27.6	27.6	27.6	26.5	24.2	22.9	22.0	21.8	20.4	17.6
64	18			04-00	08-00	17-44	60-53	27.3	27.3	27.3	27.3	26.4	23.7	22.3	21.5	21.0	19.9	18.1
65	18			14-00	18-00	16-24	62-15	28.5	28.2	28.1	28.1	24.7	20.6	18.3	16.7	16.5	16.0	14.9
66	19			04-00	08-00	14-48	64-10	28.7	28.7	28.7	28.7	26.2	21.7	19.9	18.7	18.2	15.9	13.1
67	19			14-00	18-00	13-52	65-24	28.3	28.3	28.3	28.3	23.3	21.1	19.7	18.6	16.4	13.6	
68	20			03-00	08-00	11-28	65-52	28.3	28.3	22.3	17.8	16.2	15.4	14.5	14.0	13.8	12.7	12.9
69	20			13-00	18-00	10-36	67-18	28.5	28.5	28.5	28.5	24.1	21.3	19.8	18.0	15.5	13.7	12.6
70	21			03-00	08-00	9-14	69-37	28.8	28.8	28.8	26.6	20.5	16.8	14.3	13.8	13.2	12.2	11.5
71	21			13-00	18-00	9-00	71-40	28.7	28.7	24.0	21.2	18.2	16.8	15.1	13.5	12.9	12.3	
72	22			03-00	08-00	7-16	72-50	27.8	27.8	27.8	26.7	20.8	17.8	16.4	15.5	14.5	12.5	11.7
73	22			13-00	18-00	6-23	74-14	28.5	28.4	28.3	27.7	18.5	17.7	16.2	15.2	14.6		
74	23			03-00	08-00	5-04	76-14	28.5	28.5	28.5	28.5	26.6	20.5	18.8	17.7	16.3	14.5	12.7
75	23			13-00	18-00	4-05	78-20	28.7	28.7	28.7	28.7	27.3	22.8	20.1	18.2	17.0	13.9	12.1
76	24			03-00	08-00	2-30	80-55	28.4	28.4	28.4	27.8	26.7	23.1	20.0	16.7	14.9	12.8	11.9
77	24			13-00	18-00	1-23	82-54	28.7	28.7	28.7	28.7	28.7	25.4	20.0	16.7	14.5	12.8	11.7
78	25			02-00	08-00	0-08N	85-22E	28.7	28.7	28.7	28.7	28.7	25.2	20.5	17.5	15.0	13.6	12.2
79	25			12-00	18-00	1-04	87-08	29.1	29.1	29.1	29.0	28.3	24.3	18.5	15.3	14.0	13.2	12.1
80	26			02-00	08-00	2-23	89-32	29.2	29.2	29.2	28.7	28.6	26.7	21.4	17.5	15.3	13.6	12.7
81	26			12-00	18-00	3-28	91-05	29.3	29.3	28.7	28.5	28.2	27.4	25.0	18.2	15.7	13.2	12.1

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)										
	Day	Month	Year	GMT	LMT	Lat.	Long.	0	10	20	30	50	75	100	125	150	200	250
82	27	Mar.	1976	02-00	08-00	5-03N	93-17E	28.8	28.8	28.8	28.7	27.9	22.8	19.7	17.8	16.6	14.4	12.1
83	27			12-00	18-00	6-09	94-54	29.3	29.3	28.7	28.2	28.2	28.5	24.0	17.3	15.5	13.2	12.1
84	28			01-00	08-00	6-03	97-26	29.3	29.0	28.7	28.2	26.7	23.9	18.4	16.2	14.3	12.4	11.9
85	12	Apr.	1976	09-00	17-00	24-13	123-23	24.3	24.2	24.2	24.2	24.2	24.2	22.8	21.7	20.7	20.5	18.7
86	13			22-30*	07-30	26-01	125-16	24.5	24.5	24.2	24.0	23.4	22.7	22.1	20.9	20.0	18.1	18.7
87	13			08-30	17-30	27-04	126-45	24.4	24.2	23.7	23.5	23.0	22.5	22.4	21.9	21.1	20.0	
88	14			23-00*	08-00	28-28	128-52	21.8	21.8	21.5	21.3	21.3	21.3	21.3	21.3	21.3	20.3	
89	14			08-30	17-30	29-25	130-13	21.9	21.9	21.7	21.6	21.1	20.8	20.8	20.8	20.4	19.6	17.6
90	15			23-00*	08-00	31-15	131-51	21.3	21.3	21.3	21.3	21.3	21.0	20.7	20.4	20.1	17.9	14.5

* The time of the data of the preceding day.

Table 3. Vertical observation data.

St. 1		Date Time (GMT) (LMT)		: Dec. 17, 1975 : 0145-0250 : 0845-0950		Time (GMT) (LMT)		: 02-00 : 09-00		Wind Dir. Vel.		: WSW : 18 m/s			
Lat.		: 34-16 S		Weather Air temp.		: bc : 18.0°C		Humidity Sea		: 69 % : 3					
Long.		: 115-53 E		Atm. press.		: 1023.2 mb		Swell		: WSW-3					
Observed												Interpolated			
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity (meq/L)					
0	18.50	35.659	8.39	5.54	0.10	2	0.00	0.0	0.0	0.0	0	18.50	35.659	25.67	0.000
9	18.69	35.669	8.40	5.56	0.10	1	0.14	0.2	0.2	0.2	10	18.69	35.669	25.63	0.024
18	18.64	35.670	8.42	5.51	0.10	3	0.10	0.1	0.1	0.1	20	18.64	35.670	25.64	0.047
27	18.67	35.668	8.40	5.43	0.12	2	0.00	0.0	0.0	0.0	30	18.72	35.668	25.62	0.071
45	18.64	35.663	8.40	5.45	0.08	1	0.09	0.2	0.0	0.0	50	18.21	35.657	25.74	0.118
68	16.50	35.634	8.41	5.61	0.10	1	0.01	0.0	0.3	0.3	75	16.23	35.633	26.20	0.169
90	15.88	35.625	8.40	5.60	0.14	0	0.07	0.1	1.8	1.8	100	15.59	35.603	26.32	0.214
111	15.25	35.567	8.39	5.43	0.23	0	0.10	1.0	0.7	0.7	125	14.73	35.505	26.44	0.256
130	14.54	35.481	8.38	5.45	0.29	0	0.03	2.0	0.0	0.0	150	13.87	35.409	26.55	0.296
167	13.36	35.346	8.36	5.52	0.37	0	0.10	3.4	0.1	0.1	200	12.48	35.176	26.65	0.371
207	12.30	35.140	8.34	5.65	0.45	2	0.15	6.9	0.1	0.1	250	11.17	34.996	26.76	0.441
250	11.17	34.996	8.31	5.63	0.59	2	0.01	11.	0.0	0.0	300	10.17	34.842	26.82	0.507
340	9.56	34.743	8.27	5.63	0.96	5	0.00	16.	0.0	0.0	400	8.91	34.664	26.89	0.635
430	8.65	34.638	8.26	5.42	1.11	6	0.03	17.	0.1	0.1	500	8.01	34.562	26.95	0.758
520	7.82	34.542	—	5.23	1.29	10	0.02	21.	0.1	0.1	600	6.70	34.467	27.06	0.873
700	5.28	34.404	8.15	4.69	1.80	31	0.00	24.	0.0	0.0	700	5.28	34.404	27.19	0.976
870	3.82	34.413	—	—	—	—	—	—	—	—	800	4.31	34.398	27.30	1.068
1040	3.26	34.468	8.08	3.95	2.19	64	0.00	26.	0.0	0.0	1000	3.34	34.453	27.44	1.227
1300	2.84	34.562	8.06	3.76	2.23	77	0.00	—	0.1	0.1	1200	2.96	34.526	27.53	1.363
1745	2.44	34.685	8.07	3.77	2.19	101	0.00	25.	0.0	0.0	1500	2.61	34.623	27.64	1.542

St. 1

Date : Dec. 17, 1975
 Time (GMT) : 0145-0250
 (LMT) : 0845-0950
 Lat. : 34-16 S
 Long. : 115-53 E

Meteorological observation

Time (GMT) : 02-00
 (LMT) : 09-00
 Weather : bc
 Air temp. : 18.0°C
 Atm. press. : 1023.2 mb
 Wind Dir. : WSW
 Vel. : 18 m/s
 Humidity : 69 %
 Sea : 3
 Swell : WSW-3

St. 2

Date : Dec. 19, 1975
 Time (GMT) : 0100-0500
 Time (LMT) : 0800-1200
 Lat. : 42-05 S
 Long. : 109-01 E

Meteorological observation
 Time (GMT) : 03-00
 Weather : b
 Air temp. : 12.8°C
 Atm. press. : 1017.0 mb
 Wind Dir. : NNW
 Vel. : 9 m/s
 Humidity : 78 %
 Sea : 3
 Swell : SW-1

Observed											Interpolated					
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	(μg-atoms/L)					NH ₄ -N	Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
					PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NO ₃ -N							
0	11.60	34.752	8.30	6.22	0.56	8	0.21	7.9	0.1		0	11.60	34.752	26.49	0.000	
9	11.92	34.769	8.32	6.40	0.61	5	0.25	8.1	0.0		10	11.94	34.769	26.44	0.016	
18	12.02	34.768	8.34	6.33	0.52	8	0.21	9.4	0.2		20	11.99	34.767	26.43	0.032	
28	11.84	34.761	8.34	6.31	0.54	5	0.13	9.2	0.0		30	11.81	34.759	26.46	0.048	
46	11.63	34.745	8.33	6.33	0.65	5	0.22	6.9	0.1		50	11.62	34.744	26.48	0.079	
69	11.56	34.744	8.33	6.20	0.61	4	0.21	9.7	0.4		75	11.52	34.737	26.50	0.119	
91	11.30	34.742	8.32	6.20	0.71	5	0.28	6.9	0.7		100	11.02	34.799	26.64	0.156	
113	10.63	34.877	8.33	6.07	0.71	7	0.36	9.0	0.2		125	10.51	34.872	26.78	0.190	
135	10.48	34.850	8.33	6.08	0.78	4	0.09	10.0	0.1		150	10.41	34.840	26.78	0.223	
179	10.30	34.826	8.31	6.12	0.73	3	0.03	9.7	0.0		200	10.19	34.805	26.79	0.289	
222	10.09	34.788	8.31	6.14	0.80	5	0.00	11.	0.0		250	10.09	34.795	26.80	0.354	
266	10.10	34.802	8.31	6.07	0.78	4	0.00	11.	0.1		300	9.98	34.787	26.81	0.420	
355	9.71	34.750	8.29	5.89	0.94	5	0.00	13.	0.0		400	9.57	34.737	26.84	0.551	
443	9.45	34.725	8.27	5.83	1.01	3	0.00	14.	0.3		500	9.28	34.700	26.86	0.681	
531	9.17	34.685	8.26	5.78	1.04	3	0.00	17.	0.0		600	8.87	34.647	26.88	0.811	
706	8.18	34.577	8.23	5.55	1.36	8	0.00	17.	0.0		700	8.23	34.581	26.93	0.939	
885	6.19	34.422	8.15	4.76	1.83	22	0.00	25.	0.4		800	7.18	34.494	27.02	1.060	
1075	4.32	34.336	8.10	4.80	1.99	35	0.00	27.	0.0		1000	4.99	34.358	27.19	1.278	
1352	3.15	34.418	8.07	4.26	2.20	63	0.00	28.	0.1		1200	3.64	34.357	27.33	1.462	
1804	2.65	34.595	8.06	3.89	2.30	86	0.00	29.	0.1		1500	2.88	34.477	27.50	1.692	
2255	2.33	34.697	8.07	4.13	2.15	97	0.00	30.	0.4		2000	2.50	34.748	27.67	2.000	
2713	1.99	34.734	8.08	4.52	2.15	103	0.00	26.	0.1		2500	2.16	34.724	27.76	2.253	
3181	1.50	34.727	8.05	4.71	2.13	113	0.03	29.	0.1		3000	1.69	34.733	27.80	2.475	
3657	1.06	34.705	8.09	4.83	2.18	130	0.00	32.	0.0		3500	1.20	34.714	27.82	2.672	

St. 3

Date : Dec. 21, 1975
 Time (GMT) : 0130-0330
 Time (LMT) : 0830-1030
 Lat. : 49-10 S
 Long. : 106-35 E
 Meteorological observation
 Time (GMT) : 02-00
 Time (LMT) : 09-00
 Weather : bc
 Air temp. : 6.3°C
 Atm. press. : 1006.8 mb
 Wind Dir. : WSW
 Vel. : 7 m/s
 Humidity : 81 %
 Sea : 3
 Swell : W-3

Observed										Interpolated					
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	(μg-atoms/L)					Depth (m)	T (°C)	S (‰)	σ _t	ΔD
						SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalini- ity (meq/L)					
0	5.60	33.932	8.24	7.22	1.48	5	0.23	19.	0.3		0	5.60	33.932	26.78	0.000
8	5.55	33.929	8.26	7.27	1.48	5	0.27	18.	0.1		10	5.54	33.929	26.79	0.013
18	5.51	33.927	8.28	7.27	1.50	5	0.22	16.	0.2		20	5.48	33.926	26.79	0.025
26	5.41	33.924	8.29	7.24	1.46	5	0.19	20.	0.3		30	5.42	33.925	26.80	0.038
44	5.46	33.929	8.27	7.24	1.52	4	0.21	17.	0.3		50	5.39	33.929	26.80	0.063
65	5.11	33.929	8.29	7.29	1.48	4	0.21	19.	0.3		75	4.84	33.925	26.87	0.094
84	4.59	33.931	8.27	7.27	1.60	5	0.23	19.	0.1		100	4.29	34.000	26.98	0.123
103	4.25	34.014	8.25	6.92	1.78	10	0.25	22.	0.0		125	4.15	34.038	27.03	0.150
124	4.15	34.038	8.24	6.76	1.78	11	0.01	22.	0.0		150	4.08	34.057	27.05	0.176
164	4.09	34.073	8.23	6.53	1.74	13	0.01	23.	0.0		200	4.33	34.175	27.12	0.226
204	4.36	34.187	8.20	5.88	1.91	16	0.00	27.	0.1		250	4.39	34.228	27.15	0.274
244	4.44	34.228	8.19	5.66	1.91	20	0.00	27.	0.0		300	3.84	34.224	27.21	0.320
320	3.57	34.218	8.15	5.63	2.05	25	0.00	29.	0.0		400	3.13	34.267	27.31	0.404
400	3.13	34.267	8.12	5.25	2.17	36	0.00	28.	0.0		500	2.77	34.320	27.39	0.481
480	2.82	34.307	8.11	5.00	2.30	43	0.00	33.	0.0		600	2.57	34.385	27.45	0.551
640	2.53	34.412	8.11	4.60	2.38	58	0.00	31.	0.0		700	2.48	34.447	27.51	0.616
796	2.42	34.502	8.07	4.28	2.38	69	0.00	32.	0.0		800	2.42	34.504	27.56	0.675
954	2.30	34.592	8.06	4.18	2.30	74	0.00	29.	0.0		1000	2.30	34.613	27.66	0.783
1196	2.31	34.682	8.08	4.23	2.19	79	0.00	29.	0.0		1200	2.31	34.683	27.72	0.877
1610	2.12	34.753	8.12	4.53	2.07	85	0.00	24.	0.0		1500	2.19	34.742	27.77	1.007
2031	1.72	34.762	8.13	4.63	2.19	96	0.00	26.	0.0		2000	1.75	34.763	27.82	1.203
2483	1.24	34.745	8.09	4.81	2.30	113	0.00	21.	0.0						

St. 4

Date : Dec. 23, 1975
 Time (GMT) : 0145-0405
 Lat. : 57-00 S
 Long. : 101-45 E
 Meteorological observation
 Time (GMT) : 03-00
 Wind Dir. : NNW
 Weather : bc
 Humidity : 86 %
 Air temp. : 2.8 °C
 Sea : 2
 Swell : NE-1
 Atm. press. : 986.0 mb

Observed										Interpolated					
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
					(μg-atoms/L)										
0	0.90	33.990	8.25	8.16	1.67	32	0.34	26.	0.1		0	0.90	33.990	27.26	0.000
10	0.98	33.982	8.25	8.21	1.68	35	0.33	24.	0.3		10	0.98	33.982	27.25	0.008
18	0.95	33.981	8.28	8.18	1.62	35	0.30	23.	0.3		20	0.93	33.981	27.25	0.017
28	0.83	33.981	8.29	8.16	1.62	35	0.28	27.	0.1		30	0.79	33.981	27.26	0.025
47	0.41	33.983	8.28	8.23	1.72	30	0.29	28.	0.1		50	0.38	33.982	27.29	0.041
71	-0.01	33.996	8.28	8.12	1.78	33	0.29	21.	0.3		75	-0.26	34.004	27.34	0.060
94	-1.14	34.080	8.23	7.81	2.09	54	0.24	23.	0.3		100	-0.96	34.126	27.47	0.077
117	-0.07	34.273	8.16	6.42	2.26	64	0.10	27.	0.0		125	0.26	34.336	27.58	0.092
140	0.79	34.440	8.12	5.22	2.34	76	0.01	31.	0.0		150	1.01	34.486	27.65	0.104
186	1.41	34.581	8.09	4.54	2.17	86	0.01	29.	0.0		200	1.45	34.596	27.71	0.125
231	1.47	34.613	8.09	4.47	2.26	87	0.01	32.	0.0		250	1.58	34.635	27.73	0.144
277	1.74	34.664	8.10	4.32	2.09	88	0.00	28.	0.0		300	1.79	34.673	27.75	0.163
368	1.78	34.680	8.11	4.36	2.09	92	0.00	27.	0.0		400	1.75	34.686	27.76	0.200
462	1.68	34.695	8.11	4.47	2.11	92	0.01	25.	0.0		500	1.64	34.699	27.78	0.235
556	1.58	34.704	8.12	4.49	1.97	94	0.00	26.	0.0		600	1.57	34.709	27.79	0.269
738	1.55	34.724	8.14	4.65	1.99	99	0.00	26.	0.0		700	1.55	34.720	27.80	0.303
920	1.41	34.729	8.14	—	2.01	103	0.00	28.	0.2		800	1.51	34.727	27.81	0.336
1104	1.25	34.722	8.13	4.66	1.93	110	0.01	24.	0.1		1000	1.34	34.727	27.82	0.400
1380	1.01	34.711	8.13	4.78	1.95	116	0.00	27.	0.0		1200	1.17	34.718	27.83	0.463
1844	0.66	34.692	8.13	4.85	1.95	127	0.00	24.	0.2		1500	0.91	34.706	27.84	0.555
2312	0.35	34.673	8.11	5.01	2.07	137	0.01	25.	0.0		2000	0.55	34.685	27.84	0.703
2780	0.10	34.660	8.09	5.22	2.15	138	0.00	25.	0.0		2500	0.24	34.667	27.85	0.842
3264	-0.04	34.660	8.08	5.45	2.15	138	0.02	25.	0.1		3000	0.02	34.658	27.85	0.972

St. 5	Date : Dec. 28, 1975				Time (GMT) : 05-00				Wind Dir. : SSW							
	Time (GMT) : 0445-0610				Time (GMT) : 09-00				Vel. : 4 m/s							
	Time (GMT) : 0845-1010				Weather : bc				Humidity : 86 %							
	Lat. : 65-11 S				Air temp. : 0.5 °C				Sea : 1							
Long. : 60-07 E				Atm. press. : 989.5 mb				Swell : NE-1								
Observed													Interpolated			
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)			NH ₄ -N	Alkalin- ity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NO ₂ -N							
0	-1.00	33.612	8.20	8.06	1.87	60	0.31	26.	0.31	0.1		0	-1.00	33.612	27.05	0.000
10	-1.05	33.589	8.19	8.07	2.03	60	0.35	26.	0.35	0.0		10	-1.05	33.589	27.03	0.010
20	-1.07	33.582	8.21	8.03	1.97	60	0.36	28.	0.36	0.3		20	-1.07	33.582	27.03	0.021
30	-1.29	33.598	8.21	7.91	1.99	59	0.34	28.	0.34	0.0		30	-1.29	33.598	27.05	0.031
50	-1.54	33.871	8.18	7.39	2.15	64	0.25	28.	0.25	0.0		50	-1.54	33.871	27.28	0.049
75	-1.53	34.127	8.17	6.75	2.34	68	0.15	30.	0.15	0.1		75	-1.53	34.127	27.48	0.067
98	-1.57	34.271	8.17	6.94	2.34	67	0.06	30.	0.06	0.1		100	-1.53	34.281	0.080	0.080
124	-0.65	34.389	8.15	6.27	2.34	74	0.09	31.	0.09	0.1		125	-0.59	34.395	27.67	0.092
149	0.74	34.522	8.08	4.94	2.64	84	0.09	33.	0.09	0.0		150	0.77	34.525	27.70	0.102
198	1.62	34.623	8.06	4.25	2.40	95	0.10	34.	0.10	0.0		200	1.63	34.625	27.72	0.122
246	1.60	34.649	8.06	4.30	2.46	97	0.03	33.	0.03	0.0		250	1.60	34.651	27.74	0.141
295	1.62	34.666	8.08	4.37	2.42	97	0.03	33.	0.03	0.0		300	1.62	34.667	27.76	0.160
394	1.57	34.682	8.08	4.50	2.42	97	0.00	32.	0.00	0.0		400	1.57	34.683	27.77	0.195
495	1.50	34.694	8.08	4.50	2.40	100	0.00	32.	0.00	0.1		500	1.49	34.694	27.79	0.229
594	1.38	34.699	8.10	4.63	2.36	105	0.00	32.	0.00	0.0		600	1.37	34.699	27.80	0.263
792	1.19	34.702	8.11	4.71	2.32	111	0.00	32.	0.00	0.0		700	1.27	34.702	27.81	0.295
987	1.02	34.695	8.11	4.74	2.38	116	0.02	32.	0.02	0.1		800	1.18	34.702	27.82	0.327
1184	0.85	34.685	8.10	4.76	2.38	121	0.01	32.	0.01	0.2		1000	1.01	34.694	27.82	0.390
1484	0.64	34.676	8.10	4.75	2.40	129	0.02	33.	0.02	0.1		1200	0.84	34.684	27.82	0.452
1981	0.34	34.662	8.09	4.94	2.38	134	0.00	33.	0.00	0.0		1500	0.63	34.676	27.83	0.542
2466	0.13	34.652	8.08	5.12	2.50	143	0.08	33.	0.08	0.0		2000	0.33	34.662	27.84	0.687
2911	-0.09	34.641	8.06	5.42	2.50	136	0.02	33.	0.02	0.0		2500	0.11	34.651	27.84	0.824

St. 6		Meteorological observation														
		Date		Time (GMT)		Wind Dir.		NE								
		Time (GMT)		(LMT)		Vel.		4 m/s								
		Lat.		Weather		Humidity		87 %								
Long.		Air temp.		Sea		2										
		Atm. press.		984.9 mb		Swell		E-1								
Observed												Interpolated				
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N							
0	-0.40	33.771	8.20	7.91	1.76	62	0.28	29.	0.3		0	-0.40	33.771	27.16	0.000	
10	-0.50	33.771	8.20	7.96	1.78	62	0.28	28.	0.3		10	-0.50	33.771	27.16	0.009	
20	-0.52	33.783	8.21	7.98	1.80	62	0.27	27.	0.2		20	-0.52	33.783	27.17	0.018	
30	-0.89	33.895	8.21	7.69	1.88	64	0.20	30.	0.2		30	-0.89	33.895	27.28	0.027	
49	-1.65	34.106	8.19	7.62	1.96	62	0.12	28.	0.1		50	-1.66	34.113	27.48	0.041	
74	-1.74	34.212	8.17	7.28	1.98	101	0.14	32.	0.1		75	-1.74	34.214	27.56	0.055	
99	-1.82	34.249	8.18	7.27	2.14	103	0.11	32.	0.0		100	-1.82	34.250	27.59	0.068	
123	-1.77	34.267	8.17	7.19	2.02	102	0.02	31.	0.0		125	-1.77	34.268	27.60	0.081	
147	-1.76	34.272	8.17	7.16	2.12	102	0.03	32.	0.1		150	-1.77	34.273	27.61	0.093	
197	-1.75	34.304	8.17	6.99	1.98	104	0.04	32.	0.2		200	-1.72	34.308	27.64	0.116	
245	-1.06	34.379	8.13	6.49	2.10	116	0.00	34.	0.1		250	-0.97	34.390	27.68	0.138	
294	-0.22	34.487	8.11	5.72	2.10	126	0.00	33.	0.2		300	-0.15	34.497	27.73	0.157	
391	0.44	34.605	8.10	5.19	2.18	140	0.00	33.	0.2		400	0.47	34.612	27.79	0.192	
489	0.60	34.657	8.09	5.00	2.14	149	0.00	33.	0.1		500	0.60	34.659	27.82	0.223	
588	0.51	34.669	8.09	5.00	2.18	157	0.00	35.	0.1		600	0.50	34.670	27.83	0.252	
784	0.19	34.675	8.09	5.40	2.16	172	0.00	34.	0.2		700	0.16	34.675	27.85	0.280	

St. 6

Date : Feb. 25, 1976
 Time (GMT) : 0509-0610
 (LMT) : 0809-0910
 Lat. : 67-34 S
 Long. : 33-25 E

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 09-00
 Weather : b
 Air temp. : 0.2 °C
 Atm. press. : 984.9 mb
 Wind Dir. : NE
 Vel. : 4 m/s
 Humidity : 87 %
 Sea : 2
 Swell : E-1

St. 7	Date : Feb. 26, 1976				Time (GMT) : 06-00				Wind Dir. : E							
	Time (GMT) : 0500-0713				(LMT) : 09-00				Vel. : 11 m/s							
	(LMT) : 0800-1013				Weather : s				Humidity : 82 %							
	Lat. : 66-09 S				Air temp. : 0.6 °C				Sea : 4							
Long. : 33-43 E				Atm. press. : 976.4 mb				Swell : E-3								
Observed													Interpolated			
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N							
0	-0.20	33.884	8.21	7.74	1.70	45	0.27	30.	0.3		0	-0.20	33.884	27.24	0.000	
10	0.31	33.875	8.20	7.79	1.84	62	0.32	28.	0.4		10	0.31	33.875	27.21	0.009	
18	0.34	33.875	8.21	7.81	1.70	61	0.30	27.	0.3		20	0.33	33.874	27.20	0.017	
25	0.29	33.874	8.23	7.79	1.80	45	0.29	29.	0.4		30	0.30	33.867	27.20	0.026	
40	0.25	33.874	8.23	7.81	1.86	61	0.30	29.	0.5		50	-0.30	33.985	27.32	0.042	
75	-1.65	34.260	8.21	7.41	1.80	64	0.13	32.	0.5		75	-1.65	34.260	27.60	0.058	
88	-1.70	34.262	8.18	6.91	1.96	67	0.07	33.	0.4		100	-1.74	34.300	27.63	0.070	
100	-1.74	34.300	8.21	7.10	1.96	65	0.18	31.	0.2		125	-1.76	34.312	27.64	0.082	
130	-1.75	34.310	8.19	7.09	1.96	66	0.13	31.	0.2		150	-1.61	34.324	27.65	0.093	
160	-1.52	34.333	8.18	6.82	1.96	70	0.00	32.	0.2		200	-1.06	34.401	27.69	0.114	
190	-1.25	34.375	8.18	6.54	1.94	73	0.02	34.	0.2		250	-0.01	34.534	27.75	0.133	
250	-0.01	34.534	8.12	5.55	1.98	83	0.00	34.	0.1		300	0.57	34.604	27.78	0.150	
312	0.65	34.613	8.10	5.00	2.02	93	0.01	36.	0.2		400	0.64	34.634	27.80	0.183	
375	0.61	34.626	8.11	5.07	2.04	96	0.00	35.	0.2		500	0.73	34.666	27.82	0.213	
509	0.74	34.669	8.11	4.91	2.04	104	0.00	34.	0.2							
590	0.65	34.680	8.12	4.89	2.06	108	0.00	33.	0.2							

St. 8

Date : Feb. 27, 1976
 Time (GMT) : 0520-0934
 Time (LMT) : 0820-1234
 Lat. : 63-05 S
 Long. : 33-34 E

Meteorological observation
 Time (GMT) : 07-00
 Time (LMT) : 10-00
 Weather : bc
 Air temp. : 2.3 °C
 Atm. press. : 970.8 mb

Wind Dir. : ESE
 Vel. : 1 m/s
 Humidity : 91 %
 Sea : 2
 Swell : NNW-4

Observed												Interpolated				
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)			NH ₄ -N	Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NO ₃ -N							
0	1.80	33.808	8.21	7.61	1.74	41	0.69	27.	—	1.4	—	0	1.80	33.808	27.06	0.000
10	1.63	33.768	8.23	7.63	1.70	39	0.55	24.	—	0.2	—	10	1.63	33.768	27.04	0.010
20	1.62	33.767	8.25	7.62	1.54	37	0.52	25.	—	0.4	—	20	1.62	33.767	27.04	0.021
30	1.58	33.767	8.26	7.56	1.54	35	0.57	25.	—	0.2	—	30	1.58	33.767	27.04	0.031
49	-1.09	34.123	8.28	8.20	1.68	35	0.37	25.	—	1.4	—	50	-1.15	34.126	27.47	0.047
65	-1.53	34.143	8.28	7.81	1.50	47	0.37	26.	—	0.2	—	75	-1.67	34.195	27.54	0.062
71	-1.63	34.182	8.28	7.70	1.84	51	0.40	28.	—	0.5	—	100	-1.30	34.261	27.59	0.075
95	-1.55	34.236	8.28	7.42	1.92	57	0.28	27.	—	0.4	—	125	-1.56	34.334	27.65	0.087
110	-1.09	34.229	8.23	6.83	1.78	68	0.23	30.	—	0.3	—	150	-1.35	34.442	27.73	0.097
115	-1.40	34.300	—	—	—	—	—	—	—	—	—	200	-0.05	34.600	27.81	0.114
165	-0.80	34.523	8.15	4.92	1.86	92	0.00	33.	—	0.0	—	250	0.92	34.650	27.79	0.129
245	0.87	34.646	8.11	4.37	1.88	99	0.	33.	—	0.0	—	300	1.28	34.679	27.79	0.146
338	1.35	34.687	8.13	4.41	1.92	101	0.	32.	—	0.4	—	400	1.33	34.698	27.80	0.178
433	1.27	34.701	8.12	4.49	1.80	103	0.	33.	—	0.4	—	500	1.27	34.709	27.82	0.209
617	1.24	34.717	8.14	4.57	1.90	109	0.	33.	—	1.5	—	600	1.25	34.716	27.82	0.240
796	0.94	34.709	8.13	4.59	1.90	121	0.	30.	—	0.1	—	700	1.12	34.715	27.83	0.270
920	0.75	34.703	8.13	4.60	1.70	127	0.	33.	—	0.0	—	800	0.93	34.709	27.84	0.300
1133	0.79	34.703	8.14	4.60	1.70	122	0.	34.	—	0.0	—	1000	0.75	34.703	27.84	0.357
1407	0.52	34.694	8.12	4.93	1.84	134	0.	34.	—	0.0	—	1200	0.74	34.701	27.84	0.414
1882	0.32	34.681	8.12	4.83	1.88	140	0.	35.	—	0.0	—	1500	0.47	34.691	27.85	0.497
2353	0.09	34.672	8.07	5.06	2.20	143	0.	34.	—	0.2	—	2000	0.26	34.679	27.85	0.631
2832	-0.08	34.664	8.07	5.25	2.08	139	0.	34.	—	0.0	—	2500	0.03	34.669	27.86	0.757
3310	-0.16	34.662	8.09	5.41	1.96	139	0.	34.	—	0.2	—	3000	-0.11	34.663	27.86	0.875
2789	-0.24	34.658	8.06	5.50	1.98	138	0.	34.	—	0.2	—	3500	-0.19	34.660	27.86	0.986
4272	-0.28	34.655	8.05	5.61	1.96	140	0.	33.	—	0.1	—	4000	-0.26	34.657	27.86	1.091
4512	-0.29	34.654	8.10	5.52	1.82	138	0.	34.	—	0.5	—	4500	-0.29	34.654	27.86	1.191

Depth (m)		Observed										Interpolated				
		T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	Alkalinity (μg-atoms/L)				Depth (m)	T (°C)	S (‰)	σ _t	ΔD
								NO ₂ -N	NO ₃ -N	NH ₄ -N	ity (meq/L)					
0	2.60	33.720	8.20	7.55	1.68	36	0.51	26.	0.2	0.2	0	2.60	33.720	26.92	0.000	
10	2.45	33.714	8.21	7.60	1.68	39	0.55	26.	0.3	0.3	10	2.45	33.714	26.93	0.011	
20	2.45	33.714	8.22	7.61	1.60	40	0.54	26.	0.2	0.2	20	2.45	33.714	26.93	0.023	
30	2.43	33.718	8.24	7.59	1.58	35	0.51	25.	0.0	0.0	30	2.43	33.718	26.94	0.034	
48	2.41	33.715	8.23	7.59	1.70	36	0.51	26.	0.3	0.3	50	2.07	33.741	26.98	0.056	
67	-0.91	33.970	8.24	8.14	1.84	44	0.35	27.	0.4	0.4	75	-1.30	34.002	27.38	0.079	
85	-1.37	34.012	8.23	8.10	1.88	51	0.35	28.	0.5	0.5	100	-1.42	34.029	27.40	0.096	
105	-1.41	34.036	8.23	7.85	1.88	53	0.42	28.	0.5	0.5	125	-1.30	34.094	27.45	0.112	
120	-1.42	34.077	8.22	7.70	1.92	54	0.42	29.	1.5	1.5	150	-0.41	34.199	27.50	0.128	
159	0.02	34.244	8.12	6.22	2.00	70	0.06	33.	0.2	0.2	200	1.48	34.475	27.61	0.155	
196	1.43	34.463	8.04	4.52	2.36	86	0.03	36.	0.1	0.1	250	1.56	34.550	27.67	0.178	
237	1.57	33.536	8.04	4.31	2.28	91	0.00	36.	0.3	0.3	300	1.50	34.589	27.70	0.200	
311	1.48	34.594	8.03	4.33	2.28	94	0.00	36.	0.2	0.2	400	1.62	34.654	27.75	0.239	
387	1.60	34.646	8.03	4.30	2.22	97	0.00	34.	0.3	0.3	500	1.70	34.695	27.77	0.275	
465	1.68	34.685	8.05	4.30	2.08	97	0.00	33.	0.3	0.3	600	1.70	34.709	27.78	0.311	
611	1.69	34.710	8.08	4.48	2.08	113	0.00	32.	0.3	0.3	700	1.55	34.116	27.80	0.345	
780	1.41	34.718	8.08	4.54	2.12	98	0.00	32.	0.1	0.1	800	1.39	34.719	27.81	0.377	
946	1.26	34.721	8.08	4.62	2.14	103	0.00	32.	1.5	1.5	1000	1.20	34.721	27.83	0.440	
1216	0.98	34.717	8.08	4.70	2.14	119	0.00	32.	0.1	0.1	1200	1.00	34.718	27.84	0.501	
1487	0.74	34.705	8.08	4.73	2.02	127	0.00	33.	0.3	0.3	1500	0.73	34.704	27.85	0.589	
1918	0.44	34.690	8.07	4.74	2.20	137	0.00	34.	0.3	0.3	2000	0.41	34.688	27.85	0.728	
2354	0.29	34.680	8.04	4.92	2.28	141	0.00	35.	0.2	0.2	2500	0.23	34.677	27.85	0.861	
2794	0.12	34.673	8.03	5.10	2.18	141	0.00	35.	0.4	0.4	3000	0.04	34.670	27.86	0.987	
3251	-0.05	34.666	8.06	5.23	2.18	141	0.00	35.	0.5	0.5	3500	-0.11	34.664	27.86	1.103	
3708	-0.16	34.662	8.05	5.37	2.16	141	0.00	34.	0.2	0.2	4000	-0.22	34.659	27.86	1.211	
4172	-0.25	34.658	8.04	5.52	2.16	140	0.00	34.	0.5	0.5						

Meteorological observation									
Date	: Feb. 28, 1976	Time (GMT)	: 07-00	Wind Dir.	: NE				
Time (GMT)	: 0515-0915	(LMT)	: 10-00	Vel.	: 9 m/s				
Lat.	: 0815-1215	Weather	: s	Humidity	: 90 %				
Long.	: 60-19 S	Air temp.	: 2.0 °C	Sea	: 3				
	: 33-32 E	Atm. press.	: 968.1 mb	Swell	: NW-4				

St. 9 Meteorological observation

Date : Feb. 28, 1976

Time (GMT) : 07-00

Wind Dir. : NE

Time (GMT) : 0515-0915

Weather : s

Vel. : 9 m/s

Lat. : 0815-1215

Air temp. : 2.0 °C

Humidity : 90 %

Long. : 33-32 E

Atm. press. : 968.1 mb

Sea : 3

Swell : NW-4

St. 10		Meteorological observation														
		Date		Time (GMT)		Time (GMT)		Wind Dir.		W						
		Time (GMT)	(LMT)	Time (GMT)	(LMT)	Weather	Vel.	Humidity	Sea	Swell						
		Feb. 29, 1976	0517-0922	07-00	10-00	b	10 m/s	72 %	3	NW-4						
Lat.		57-44 S		Air temp.		3.7 °C										
Long.		33-45 E		Atm. press.		978.8 mb										
Observed												Interpolated				
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N							
0	2.50	33.845	8.23	8.16	1.54	27	0.50	20.	0.3	0.3	0	2.50	33.845	27.03	0.000	
10	2.39	33.828	8.23	7.66	1.54	28	0.47	20.	0.3	0.3	10	2.39	33.828	27.03	0.010	
20	2.39	33.827	8.25	7.63	1.50	29	0.45	19.	0.3	0.3	20	2.39	33.827	27.03	0.021	
30	2.34	33.825	8.26	7.61	1.50	24	0.41	20.	0.3	0.3	30	2.34	33.825	27.03	0.031	
50	2.33	33.828	8.26	7.62	1.58	24	0.46	20.	0.5	0.5	50	2.33	33.828	27.03	0.052	
75	-0.22	33.996	8.22	7.78	1.94	45	0.37	26.	1.6	1.6	75	-0.02	33.996	27.32	0.075	
98	-0.43	34.035	8.19	7.61	2.00	52	0.45	26.	0.7	0.7	100	-0.43	34.039	27.37	0.093	
123	-0.20	34.098	8.18	7.21	2.04	49	0.18	27.	0.3	0.3	125	-0.18	34.104	27.41	0.110	
147	0.14	34.178	8.16	6.73	2.08	64	0.11	29.	0.3	0.3	150	0.22	34.192	27.46	0.127	
195	1.35	34.392	8.05	4.73	2.30	78	0.00	33.	0.3	0.3	200	1.39	34.407	27.56	0.156	
240	1.55	34.494	8.03	4.32	2.34	85	0.00	30.	0.4	0.4	250	1.61	34.512	27.63	0.181	
290	1.81	34.568	8.03	4.09	2.22	89	0.00	32.	0.4	0.4	300	1.84	34.578	27.67	0.204	
382	1.95	34.632	8.04	4.07	2.26	90	0.00	32.	0.3	0.3	400	1.96	34.642	27.71	0.247	
480	1.95	34.675	8.05	4.15	2.14	90	0.00	28.	0.4	0.4	500	1.94	34.680	27.74	0.287	
580	1.90	34.697	8.08	4.28	2.06	91	0.00	27.	0.3	0.3	600	1.89	34.701	27.76	0.325	
775	1.79	34.729	8.09	4.50	2.06	95	0.00	28.	0.3	0.3	700	1.84	34.719	27.78	0.361	
960	1.58	34.736	8.09	4.58	2.04	98	0.00	27.	0.1	0.1	800	1.77	34.731	27.80	0.396	
1150	1.30	34.728	8.09	4.59	2.10	107	0.00	30.	0.3	0.3	1000	1.52	34.735	27.82	0.464	
1430	1.00	34.714	8.09	4.71	2.16	115	0.00	26.	0.4	0.4	1200	1.23	34.725	27.83	0.528	
1600	0.92	34.711	8.10	4.73	1.98	121	0.00	27.	0.4	0.4	1500	0.96	34.713	27.84	0.621	
2048	0.54	34.694	8.08	4.72	2.16	132	0.00	31.	0.2	0.2	2000	0.58	34.696	27.85	0.767	
2489	0.34	34.684	8.06	4.91	2.32	137	0.00	28.	0.4	0.4	2500	0.33	34.684	27.85	0.905	
2929	0.14	34.673	8.06	5.05	2.24	137	0.00	26.	0.5	0.5	3000	0.11	34.672	27.86	1.035	
3380	-0.02	34.668	8.08	5.23	2.14	137	0.00	28.	0.5	0.5	3500	-0.05	34.667	27.86	1.154	
3820	-0.13	34.664	8.06	5.34	2.16	138	0.00	33.	0.6	0.6	4000	-0.17	34.662	27.86	1.266	
4273	-0.21	34.658	8.06	5.49	2.18	137	0.00	33.	0.7	0.7						

St. 11

Date : Mar. 2, 1976
 Time (GMT) : 0520-0755
 (LMT) : 0820-1055
 Lat. : 50-39 S
 Long. : 40-19 E

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 09-00
 Weather : r
 Air temp. : 5.2 °C
 Atm. press. : 993.2 mb
 Wind Dir. : W
 Vel. : 9 m/3
 Humidity : 93 %
 Sea : 2
 Swell : WNW-3

Observed											Interpolated					
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N							
0	4.40	33.763	8.21	7.32	1.52	16	0.41	23.		0.4		0	4.40	33.763	26.78	0.000
5	4.27	33.731	8.22	7.40	1.52	15	0.40	22.		0.4		10	4.27	33.728	26.77	0.012
10	4.27	33.728	8.23	7.36	1.42	15	0.40	22.		0.5		20	4.21	33.726	26.78	0.026
15	4.21	33.726	8.23	7.31	1.46	14	0.38	23.		0.2		30	4.22	33.733	26.78	0.038
25	4.23	33.728	8.23	7.31	1.54	14	0.38	22.		0.2		50	4.23	33.746	26.79	0.064
40	4.18	33.743	8.23	7.36	1.50	13	0.42	23.		0.4		75	2.33	33.799	27.01	0.093
55	4.15	33.749	8.23	7.28	1.54	14	0.40	22.		0.6		100	0.98	33.919	27.20	0.117
70	2.89	33.786	8.23	7.40	1.62	16	0.45	24.		0.7		125	1.05	33.904	27.18	0.140
85	1.34	33.830	8.22	7.42	1.80	29	0.51	25.		0.5		150	1.14	33.945	27.21	0.162
110	1.06	33.960	8.18	7.23	1.78	32	0.04	28.		0.2		200	1.97	34.195	27.35	0.202
130	1.07	33.884	—	7.38	1.86	31	0.38	27.		0.4		250	2.07	34.311	27.44	0.237
150	1.14	33.945	8.18	7.06	1.86	37	0.00	30.		0.2		300	2.10	34.375	27.49	0.269
190	1.90	34.159	8.11	5.70	2.18	45	0.00	33.		0.2		400	2.18	34.465	27.55	0.328
230	2.05	34.725	8.08	4.98	2.26	53	0.00	33.		0.1		500	2.21	34.530	27.60	0.383
270	2.08	34.338	8.03	4.65	2.28	62	0.00	34.		0.1		600	2.18	34.578	27.64	0.433
360	2.14	34.433	8.02	4.33	2.34	73	0.00	34.		0.0		700	2.17	34.613	27.67	0.481
450	2.21	34.499	8.02	4.09	2.36	77	0.00	34.		0.0		800	2.17	34.640	27.69	0.527
550	2.19	34.556	8.01	4.03	2.16	81	0.00	34.		0.2		1000	2.17	34.679	27.72	0.615
710	2.17	34.616	8.02	4.04	2.24	86	0.00	33.		0.0		1200	2.13	34.701	27.74	0.701
1015	2.17	34.681	8.05	4.13	2.08	86	0.00	32.		0.0		1500	2.05	34.730	27.77	0.825
1330	2.09	34.712	8.04	4.27	2.10	88	0.00	31.		0.1		2000	1.92	34.758	27.01	
1650	2.02	34.744	8.05	4.49	2.00	88	0.01	30.		0.0						
1970	1.93	34.758	8.05	4.63	2.00	93	0.00	30.		0.2						

St. 12		Date				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time (GMT)				Time 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St. 13

Date : Mar. 6, 1976
 Time (GMT) : 0520-0730
 (LMT) : 0820-1030
 Lat. : 35-00 S
 Long. : 50-16 E

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 09-00
 Weather : b
 Air temp. : 22.0 °C
 Atm. press. : 1010.9 mb
 Wind Dir. : SE
 Vel. : 5 m/s
 Humidity : 76 %
 Sea : 3
 Swell : ESE-1

Observed											Interpolated				
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
						SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N						
0	23.10	35.424	8.30	4.99	0.10	6	0.00	0.0	0.0	0.0	0	23.10	35.424	24.25	0.000
10	22.95	35.414	8.31	4.98	0.12	5	0.01	0.0	0.0	0.0	10	22.95	35.414	24.28	0.034
20	22.86	35.418	8.31	4.97	0.14	6	0.02	0.0	0.0	0.0	20	22.86	35.418	24.31	0.073
29	21.83	35.445	8.33	5.15	0.12	3	0.00	0.0	0.0	0.0	30	21.66	35.448	24.67	0.108
45	19.17	35.475	8.34	5.55	0.14	2	0.01	0.0	0.0	0.0	50	18.64	35.477	25.50	0.166
65	17.55	35.476	8.34	5.68	0.18	2	0.02	0.0	0.1	0.1	75	17.09	35.476	25.88	0.224
89	16.63	35.476	8.34	5.57	0.30	5	0.15	0.0	0.3	0.3	100	16.27	35.474	26.07	0.276
105	16.13	35.473	8.33	5.39	0.30	5	0.31	0.3	—	—	125	15.74	35.465	26.18	0.324
125	15.74	35.465	8.33	5.37	0.30	3	0.21	1.0	0.0	0.0	150	15.28	35.456	26.28	0.370
160	15.13	35.453	8.32	5.24	0.40	3	0.05	2.2	0.0	0.0	200	14.95	35.438	26.34	0.459
199	14.95	35.438	8.31	5.22	0.40	4	0.05	2.5	0.0	0.0	250	14.71	35.423	26.38	0.546
240	14.77	35.427	8.32	5.21	0.40	1	0.03	2.8	0.0	0.0	300	14.40	35.399	26.43	0.632
320	14.27	35.387	8.30	5.20	0.44	3	0.03	5.1	0.0	0.0	400	13.79	35.321	26.50	0.800
400	13.79	35.321	8.29	5.18	0.52	2	0.03	4.7	0.0	0.0	500	13.00	35.220	26.58	0.962
476	13.18	35.242	8.27	5.16	0.62	2	0.01	5.7	0.0	0.0	600	12.19	35.118	26.66	1.119
633	11.91	35.082	8.26	5.24	0.80	4	0.00	9.4	0.0	0.0	700	11.23	34.986	26.74	1.270
795	10.18	34.844	8.22	4.96	1.08	6	0.01	13.	0.0	0.0	800	10.12	34.837	26.82	1.415
960	8.20	34.638	8.16	4.76	1.30	13	0.00	18.	0.0	0.0	1000	7.68	34.593	27.02	1.677
1210	5.22	34.420	8.12	4.63	1.80	29	0.00	24.	0.0	0.0	1200	5.33	34.462	27.20	1.899
1635	3.16	34.511	8.06	—	1.96	66	0.00	28.	0.0	0.0	1500	3.53	34.448	27.42	2.170
2070	2.57	34.660	8.06	4.30	2.02	78	0.03	28.	0.0	0.0	2000	2.61	34.637	27.65	2.509
2508	2.19	34.735	8.05	4.43	1.92	88	0.03	24.	0.1	0.1	2500	2.20	34.734	27.77	1.766
2730	2.06	34.750	8.04	4.64	1.90	92	0.03	22.	0.0	0.0					

St. 14 Date : Mar. 8, 1976
 Time (GMT) : 0417-0813
 (LMT) : 0817-1213
 Lat. : 27-19 S
 Long. : 54-02 E

Meteorological observation
 Time (GMT) : 06-00
 (LMT) : 10-00
 Weather : b
 Air temp. : 26.0 °C
 Atm. press. : 1013.0 mb
 Wind Dir. : SE
 Vel. : 7 m/s
 Humidity : 69 %
 Sea : 3
 Swell : SSW-1

Observed												Interpolated				
Depth (m)	T (°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	(μg-atoms/L)				Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
							NO ₂ -N	NO ₃ -N	NH ₄ -N							
0	27.30	35.229	8.32	4.77	0.08	7	0.03	0.0	0.1		0	27.30	35.229	22.82	0.000	
10	27.44	35.224	8.33	4.82	0.08	5	0.07	0.0	0.0		10	27.44	35.224	22.77	0.051	
20	27.43	35.223	8.33	4.76	0.08	5	0.06	0.0	0.0		20	27.43	35.223	22.77	0.102	
30	26.70	35.454	8.34	4.62	0.08	3	0.08	0.0	0.0		30	26.70	35.454	23.18	0.151	
44	23.19	35.566	8.33	5.24	0.10	3	0.05	0.0	0.0		50	22.06	35.575	24.66	0.231	
65	20.00	35.564	8.34	5.45	0.16	1	0.06	0.0	0.0		75	19.21	35.572	25.42	0.305	
85	18.67	35.577	8.34	5.52	0.16	6	0.08	0.0	0.0		100	17.90	35.565	25.75	0.366	
96	18.06	35.567	8.33	5.31	0.18	6	0.08	0.0	0.0		125	16.92	35.542	25.97	0.421	
110	17.54	35.561	8.35	5.20	0.26	2	0.14	0.0	0.0		150	16.10	35.507	26.13	0.471	
145	16.20	35.512	8.33	5.43	0.28	2	0.13	0.6	0.0		200	15.33	35.461	26.27	0.565	
187	15.56	35.476	8.31	5.21	0.38	4	0.15	1.0	0.0		250	14.56	35.406	26.40	0.653	
224	14.92	35.433	8.31	5.11	0.46	3	0.09	2.8	0.0		300	13.97	35.353	26.48	0.737	
298	13.99	35.355	8.29	5.18	0.56	3	0.09	6.0	0.0		400	12.85	35.220	26.61	0.896	
367	13.19	35.265	8.29	5.25	0.50	3	0.13	4.2	0.0		500	11.96	35.107	26.70	1.047	
440	12.46	35.167	8.27	5.29	0.72	4	0.10	7.8	0.0		600	11.11	35.000	26.78	1.192	
586	11.24	35.020	8.25	5.54	0.90	6	0.08	11.	0.0		700	10.04	34.846	26.85	1.332	
728	9.70	34.800	8.23	5.06	1.12	9	0.07	15.	0.0		800	8.64	34.684	26.95	1.463	
879	7.44	34.571	8.16	4.65	1.52	18	0.07	22.	0.0		1000	5.81	34.469	27.18	1.693	
1132	4.37	34.422	8.08	4.38	1.94	44	0.07	28.	0.0		1200	3.96	34.434	27.36	1.878	
1527	3.00	34.583	8.06	3.95	1.94	84	0.04	31.	0.0		1500	3.01	34.565	27.56	2.098	
1932	2.45	34.698	8.07	4.15	2.06	97	0.06	30.	0.0		2000	2.39	34.709	27.73	2.379	
2361	2.14	34.739	8.03	3.95	2.30	115	0.07	29.	0.0		2500	2.06	34.741	27.78	2.611	
2798	1.91	34.738	8.03	3.84	2.40	128	0.07	29.	0.0		3000	1.78	34.736	27.80	2.829	
3245	1.63	34.733	8.06	4.07	2.10	130	0.07	26.	0.0		3500	1.49	34.729	27.82	3.037	
3695	1.39	34.725	8.05	4.19	2.16	131	0.06	25.	0.1		4000	1.22	34.720	27.83	3.234	
4149	1.14	34.718	8.05	4.52	2.06	127	0.09	24.	0.2							

Table 4(a). Harmonic constants.

Port
Position
Lat. 69°00'28''S
Long. 39°34'13''E
Time zone S = -3 00
Time and duration of observation
Epoch Feb. 2, 1975. 00h
Duration in days 353 days
Mean sea level So = 161.0 cm
Standard deflection S.D. = 8.0 cm
Break in record
Feb. 6, 1975. 10 h - Feb. 11, 1975. 01 h,
Mar. 8, 1975. 17 h - Mar. 11, 1975. 17 h,
Apr. 1, 1975. 14 h - Apr. 3, 1975. 16 h,
Apr. 4, 1975. 14 h - Apr. 5, 1975. 14 h,
Feb. 1, 1976. 10 h - Feb. 6, 1976. 00 h.

Symbol	H (cm)	K (deg.)	G (deg.)	Symbol	H(cm)	K (deg.)	G (deg.)
Sa	13.69	115.13	115.26	M ₂	23.64	166.98	174.80
Ssa	4.97	44.29	44.53	MKS ₂	0.32	92.20	100.26
Mm	1.81	192.30	193.93	λ ₂	0.23	186.63	195.86
MSf	0.40	151.81	154.85	L ₂	1.22	141.55	151.00
Mf	4.21	193.88	197.17	T ₂	1.03	171.04	181.77
2Q ₁	0.63	327.85	326.84	S ₂	19.69	182.52	193.38
σ ₁	1.35	320.79	320.00	R ₂	0.52	115.57	126.55
Q ₁	5.47	339.46	340.09	K ₂	5.33	181.60	192.71
ρ ₁	0.81	348.72	349.56	MSN ₂	0.26	101.09	113.58
O ₁	24.08	352.37	354.63	KJ ₂	0.45	28.93	41.67
MP ₁	0.52	329.11	331.61	2SM ₂	0.59	130.48	144.39
M ₁	1.10	7.90	11.81	MO ₃	0.11	299.73	309.80
χ ₁	0.22	9.62	13.75	M ₃	0.16	275.24	286.96
π ₁	0.78	5.03	10.22	SO ₃	0.34	290.99	304.11
P ₁	8.65	2.62	7.93	MK ₃	0.18	338.78	352.14
S ₁	1.77	234.71	240.14	SK ₃	0.57	337.73	354.15
K ₁	22.10	5.49	11.04	MN ₄	0.19	63.02	77.02
φ ₁	1.06	108.13	113.80	M ₄	0.45	140.47	156.10
φ ₁	0.64	343.38	349.18	SN ₄	0.03	162.80	179.84
θ ₁	0.19	355.54	2.51	MS ₄	0.26	210.81	229.49
J ₁	1.00	8.34	15.52	MK ₄	0.16	174.73	193.65
SO ₁	0.80	341.35	349.35	S ₄	0.07	209.01	230.73
OO ₁	0.50	310.80	319.65	SK ₄	0.14	210.33	232.30
OQ ₂	0.25	155.53	158.41	2MN ₆	0.03	82.74	104.54
MNS ₂	0.23	67.10	70.23	M ₆	0.11	90.23	113.67
2N ₂	0.23	68.66	73.21	MSN ₆	0.10	173.60	198.45
μ ₂	1.11	108.17	112.93	2MS ₆	0.34	203.52	230.00
N ₂	4.34	155.90	162.08	2MK ₆	0.14	193.14	219.87
ν ₂	0.90	164.60	170.99	2SM ₆	0.20	231.48	261.01
OP ₂	0.23	327.60	335.16	MSK ₆	0.20	234.43	264.21

Table 4 (b). Daily mean sea level 1975-1976.

Syowa Station

	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Remarks
1	—	1.51	—	1.61	1.75	1.62	1.77	1.72	1.77	1.62	1.47	1.48	1. Annual mean sea level
2	1.54	1.49	—	1.49	1.68	1.63	1.87	1.71	1.67	1.61	1.47	1.42	1.61
3	1.66	1.43	—	1.50	1.67	1.66	1.83	1.70	1.61	1.61	1.47	1.40	2. Highest sea level
4	1.66	1.43	—	1.50	1.68	1.69	1.75	1.66	1.61	1.65	1.44	1.43	2.48
5	1.55	1.49	—	1.52	1.73	1.65	1.78	1.62	1.59	1.59	1.49	1.41	(17-32, May 26, 1975)
6	—	1.51	1.68	1.55	1.85	1.62	1.80	1.65	1.60	1.57	1.49	1.42	3. Lowest sea level
7	—	1.52	1.77	1.58	1.95	1.62	1.74	1.61	1.64	1.59	1.47	1.41	0.38
8	—	—	1.72	1.60	1.96	1.66	1.68	1.59	1.70	1.58	1.47	1.40	(12-28, Jan. 17, 1976)
9	—	—	1.62	1.63	1.86	1.68	1.72	1.61	1.81	1.54	1.47	1.41	4. Break in record
10	—	—	1.66	1.60	1.80	1.71	1.68	1.68	1.78	1.56	1.46	1.46	1) 03-00, Feb. 1, 1975
11	—	—	1.65	1.68	1.76	1.69	1.59	1.71	1.77	1.58	1.44	1.48	23-00, Feb. 1, 1975
12	1.50	1.60	1.68	1.68	1.78	1.59	1.59	1.74	1.76	1.63	1.46	1.40	2) 10-00, Feb. 6, 1975
13	1.54	1.60	1.75	1.67	1.77	1.60	1.62	1.77	1.74	1.65	1.46	1.45	01-00, Feb. 11, 1975
14	1.51	1.59	1.83	1.67	1.76	1.59	1.64	1.78	1.68	1.61	1.45	1.43	3) 17-00, Mar. 8, 1975
15	1.53	1.56	1.82	1.63	1.70	1.62	1.68	1.75	1.66	1.66	1.41	1.36	17-00, Mar. 11, 1975
16	1.50	1.53	1.81	1.60	1.68	1.59	1.69	1.69	1.64	1.68	1.42	1.32	4) 14-00, Apr. 1, 1975
17	1.48	1.52	1.82	1.57	1.72	1.58	1.73	1.72	1.61	1.61	1.46	1.35	16-00, Apr. 3, 1975
18	1.50	1.58	1.74	1.59	1.76	1.63	1.75	1.79	1.57	1.59	1.48	1.35	5) 14-00, Apr. 4, 1975
19	1.49	1.60	1.74	1.51	1.71	1.64	1.77	1.77	1.57	1.59	1.47	1.40	14-00, Apr. 5, 1975
20	1.49	1.61	1.68	1.54	1.72	1.63	1.81	1.69	1.53	1.59	1.43	1.37	
21	1.48	1.59	1.59	1.60	1.73	1.66	1.78	1.65	1.55	1.59	1.43	1.37	
22	1.47	1.54	1.59	1.63	1.78	1.69	1.78	1.65	1.66	1.60	1.45	1.38	
23	1.45	1.49	1.63	1.70	1.81	1.70	1.77	1.66	1.68	1.59	1.43	1.40	
24	1.44	1.52	1.65	1.68	1.80	1.72	1.74	1.68	1.69	1.54	1.40	1.40	
25	1.47	1.55	1.71	1.82	1.77	1.65	1.71	1.79	1.69	1.47	1.39	1.47	
26	1.47	1.50	1.69	1.97	1.73	1.58	1.74	1.79	1.62	1.47	1.39	1.54	
27	1.45	1.52	1.66	1.91	1.71	1.63	1.75	1.76	1.63	1.49	1.42	1.51	
28	1.49	1.59	1.68	1.85	1.69	1.67	1.72	1.77	1.66	1.49	1.41	1.43	
29		1.59	1.73	1.81	1.64	1.71	1.63	1.77	1.67	1.48	1.41	1.45	
30		1.50	1.74	1.77	1.61	1.78	1.65	1.79	1.63	1.49	1.40	1.47	
31		1.51		1.77		1.72	1.68		1.62		1.46	1.48	
Mean	(1.51)	(1.54)	(1.70)	1.65	1.75	1.65	1.72	1.71	1.66	1.58	1.44	1.42	